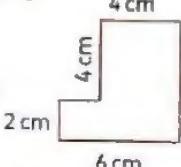


Revision 1

1. Complete.

- a. $32,621 + 18,709 =$ _____
- b. 30 thousands = _____ hundreds.
- c. The perimeter of the rectangle 2 cm  is _____ cm.
- d. The place value of the digit 4 in the number 46,385 is _____
- e. Thirty-eight thousand, five hundred two in standard form is _____

2. Choose the correct answer.

- a. $35 \div 7 =$ _____
A. 5 B. 6 C. 7 D. 8
- b. $3,000 + 829 =$ _____
A. 3,829 B. 8,293 C. 30,829 D. 3,928
- c. $8 \times$ _____ $= [8 \times 5] + [8 \times 2]$
A. 10 B. 3 C. 8 D. 7
- d. The area of the shape  is _____ square cm.
A. 30 B. 28 C. 24 D. 20
- e. The greatest number formed from 7, 2, 0, 6, 8, 1 is _____
A. 870,621 B. 876,210 C. 102,678 D. 780,621

3. Arrange the following numbers from least to greatest.

56,210 , 506,021 , 650,201 , 171,000 , 43,692

The order is: _____ , _____ , _____ , _____ , _____

4. Find.

a.
$$\begin{array}{r} 7,263 \\ - 4,081 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 43,826 \\ + 25,095 \\ \hline \end{array}$$

c. $9 \times 3,000 =$ _____

d. $7 \times 7 =$ _____

Revision 2

1. Put (<, > or =).

a. $23,629$ ————— $23,692$

c. $700,000 + 30,000 + 10$ ————— $73,100$

e. $99,999$ ————— nine hundred thousand

b. 8×0 —————

d. 3×4 —————

$8+0$

$72 \div 9$

2. Complete.

a. If $3 \times 6 = 18$, then $18 \div$ _____ = 3

b. 19,380 in expended form is _____

c. The value of 0 in the number 708,362 is _____

d. The area of a rectangle is 36 square cm and its length is 9 cm, then its width = _____ cm

e. The place value of 9 in 396,482 is _____

3. Arrange the following numbers from greatest to least.

86,006 , 80,600 , 723,014 , 210,370 , 732,140

The order is: _____ , _____ , _____ , _____ , _____

4. Hany saved 70,550 pounds in a year. In the next year he saved 84,980 pounds.

How much did he save in the two years ?

5. Match.

1cm

1m

100 mm

11cm

10 cm

10 mm

110 mm

100 cm

Revision 3

1. Choose the correct answer.

a. $54,275 - 32,938 = \underline{\hspace{2cm}}$

A. 12,337

B. 21,373

C. 21,733

D. 21,337

b. $501,326 < \underline{\hspace{2cm}}$

A. 510,200

B. 501,236

C. 51,623

D. 56,632

c. $3 \times 80 = \underline{\hspace{2cm}}$

A. 24

B. 240

C. 2,400

D. 24,000

d. $\frac{1}{7}$ of 28 = $\underline{\hspace{2cm}}$

A. $\frac{1}{8}$ of 32

B. $\frac{1}{5}$ of 30

C. $\frac{1}{6}$ of 48

D. $\frac{1}{9}$ of 18

e. The perimeter of the square  is $\underline{\hspace{2cm}}$ cm.

A. 20

B. 25

C. 10

D. 30

2. Complete.

a. Eight hundred sixty-three thousands, five hundred seven in standard form is $\underline{\hspace{2cm}}$

b. The place value of the digit 7 in 762,435 is $\underline{\hspace{2cm}}$

c. $7 \times \underline{\hspace{2cm}} = 63$

d. $\underline{\hspace{2cm}} = 100,000 + 7,000 + 30 + 5$

e. $\underline{\hspace{2cm}} \text{ tens} = 170$

3. A factory produces 800 cans of soft drink every day.

How many cans the factory produces in a week?



4. Write the greatest number and smallest number can be formed

from 9, 4, 0, 3, 1, 6.

- The greatest number: $\underline{\hspace{2cm}}$

- The smallest number: $\underline{\hspace{2cm}}$

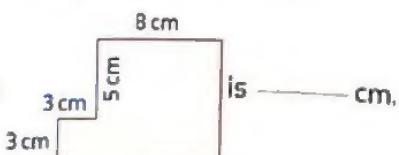
Revision 4

1. Complete.

a. _____ $\div 4 = 8$

b. $(5 \times 6) \times 7 =$ _____

c. The perimeter of the shape



is _____ cm.

d. $8,762 - 7,648 =$ _____

11 cm

e. The smallest number formed from 2, 7, 0, 6, 5 is _____

2. Choose the correct answer.

a. The value of the digit 3 in 721,362 is _____

- A. 30,000 B. 3,000 C. 300 D. 30

b. The area of the rectangle whose length is 10 cm and width is 7 cm is _____ square cm.

- A. 17 B. 34 C. 70 D. 44

c. _____ $= 1,000 + 900 + 70 + 2$

- A. 19,472 B. 1,927 C. 10,972 D. 1,972

d. $61,072 + 9,838 =$ _____

- A. 79,10 B. 70,910 C. 79,010 D. 70,091

e. $6+6+6+6+6=6\times$ _____

- A. 6 B. 5 C. 7 D. 8

3. Arrange the following from least to greatest.

5×12 , 7×8 , 3×10 , 6×9 , 8×1

The order is: _____ , _____ , _____ , _____ , _____

4. Bassem has 72 marbles, he wants to put each 8 marbles in a bag.

How many bags does Bassem need?

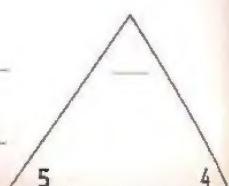
5. Find the product. Write the fact family.

• _____ \times _____ $=$ _____

• _____ \times _____ $=$ _____

• _____ \div _____ $=$ _____

• _____ \div _____ $=$ _____



1

Place Value

» Concept 1 : Reinforcing Place Value

» Concept 2 : Using Place Value



Fast Fact

The distance from
the Earth to the
Moon is about:
384,402 Km.
which equals
384,402,000 m.





Concept Overview

In concept 1:

Reinforcing Place Value, students investigate relationships between places in a place value chart, specifically how much a digit changes in value as it moves to the left within a whole number. Students review composing and decomposing numbers and apply their understanding to reading and writing numbers to the One Milliard place. These place value concepts help students master more challenging concepts in primary 4, including multiplication, division, fractions and decimals.

Lesson No.	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 1	1-1 Review Digit, Numeral, Number	Digit - Numeral - Number	<ul style="list-style-type: none">Students will explain the difference between a digit, numeral, and number.Students will discuss how the value of a digit can change.
Lesson 2	1-2 Really Big Numbers	Digit - Million - Milliard - Period - Place value	<ul style="list-style-type: none">Students will identify all whole number place values through the One Milliard place.Students will explain how the value of a digit changes based on its place in a number.
	1-3 Changing Values	Milliard - Period - Place value	<ul style="list-style-type: none">Students will explain how the value of a digit changes as it moves to the left in a whole number.Students will describe patterns they observe in changing place values.
	1-4 Review Comparing Values		<ul style="list-style-type: none">Students will explain the relationship between a given place value and the place value to its left.Students will use multiplication to compare place values.
Lesson 3	1-5 Many Ways to Write	Expanded form - Standard form - Word form	<ul style="list-style-type: none">Students will write numerals in standard, word, and expanded forms.
	1-6 Composing and Decomposing	Compose - Decompose - Decomposed form - Expanded form - Standard form - Word form	<ul style="list-style-type: none">Students will compose and decompose numerals in multiple forms.

1-1 Review Digit, Numeral, Number

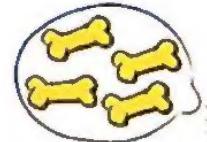
Learn

Number

A **number** is a count or measurement that is really an **idea** in our minds.

We write or talk about numbers using **numerals** such as "4" or "four".

But we could also hold up 4 fingers, or tap the ground 4 times.



These are all different ways of referring to the same number.

Numeral

A **numeral** is a **symbol** or **name** that stands for a number.

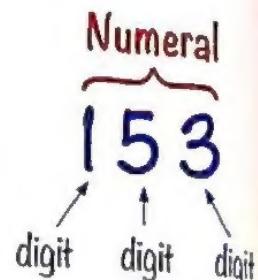
Examples : 3, 49 and twelve are all numerals.

So, the number is an idea, the numeral is how we write it.

Digit

A **digit** is a **single symbol** used to make numerals.

0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 are the ten digits we use in everyday numerals.



Examples :

- The numeral 153 is made up of 3 digits ("1", "5" and "3").
- The numeral 46 is made up of 2 digits ("4" and "6").
- The numeral 9 is made up of 1 digit ("9").

So a single digit can also be a numeral.

Notes for parents :

- Students often use the term **number** when referring to numerals. Since this is a common error we understand each other. However, the term **digit** is distinct.

So, digits make up numerals, and numerals stand for an idea of a number.



Just like letters make up words, and words stand for an idea of the thing.



Number Instead of Numeral

Often people say "Number" when they really should say "Numeral"... it doesn't really matter is you do that, because other people understand you. But try to use "digit" only when talking about the single symbols that make up numerals.

Other Types of Digits and Numerals

Different languages use different digits and number systems to create numerals.

For example :

Hindu-Arabic	0	1	2	3	4	5	6	7	8	9
Eastern Arabic	٠	١	٢	٣	٤	٥	٦	٧	٨	٩
Chinese	〇	一	二	三	四	五	六	七	八	九
Roman		I	II	III	IV	V	VI	VII	VIII	IX
Ancient Greek		α'	β'	γ'	δ'	ε'	ζ'	ξ'	η'	θ'

- Ask your child to explain the difference between a digit, a numeral and a number.

Example 1

Write each number in the appropriate column. Some may go in more than one column.

twenty-five

235

8

seven

0

one hundred

240,305

Digit	Number	Numerals

Solution 

Digit	Number	Numerals
3	235	twenty-five
2	8	235
0	0	8
	240,305	seven
		0
		one hundred
		240,305

**Check your understanding**

Circle all the numerals below.

15

nine

XXXXX

sixty-eight

subtraction

503

20 cats

7

thirty

addition

0

2,301,058

Notes for parents :

- Ask your child to write more examples for numbers, numerals and digits.

Remember Place value

The value of a digit can change in different numbers and numerals according to its place.

For example :

The value of 5 in the numeral 15 is very different than its value in the numeral 5,836

- The value of 5 in 15 is 5 [It is in Ones place]
- The value of 5 in 5,836 is 5,000 [It is in Thousands place]

Example 2

Write the value of the digit 8 in each of the following numerals :

- | | | | |
|--------|----------|-----------|-----------|
| a. 582 | b. 8,301 | c. 30,857 | d. 89,004 |
|--------|----------|-----------|-----------|

Solution

- | | | | |
|-------|----------|--------|-----------|
| a. 80 | b. 8,000 | c. 800 | d. 80,000 |
|-------|----------|--------|-----------|

check your understanding

Write the place value and the value of the colored digit.

Place value

Value

634

29,510

4,182

471,206

8,200

- Let your child remember that the position of a digit in a numeral determines its value.



Remember Comparing numbers

You can use place value to compare numbers. For example:

Compare: 2,349 and 2,617.

Begin at the left. Compare.

2,349 } Both numbers have
2,617 } 2 thousands.

Find the first place where
the digits are different. Compare.

2,349 } 3 hundreds is less
2,617 } than 6 hundreds.

So, $2,349 < 2,617$ or $2,617 > 2,349$

Remember
When comparing numbers, the number which has more number of digits is the greater.
 $5843 > 798$

Example 3

Use the following digits to make the largest number possible and the smallest number possible: 2, 4, 0, 8, 6

Solution

- The largest number possible is : 86,420
"Hint: write the digits from the greatest to the least"
- The smallest number possible is : 20,468
"Hint: write the digits from the least to the greatest, but don't put 0 digit in the highest place value".



your understanding

1. Compare, write $>$ or $<$.

3,291 ○ 3,591

5,148 ○ 4,185

2,459 ○ 4,378

6,450 ○ 6,540

2. Circle the greatest number of the following.

6,509

6,950

6,590

3. Write the greatest and the least 5-digit numbers made up from the digits : 7, 3, 6, 0, 8

Notes for parents :

- Ask your child to tell you a number greater than 4,321 and another number less than 8,765.

1-1 Review Digit, Numeral, Number

 REMEMBER PROBLEM SOLVING From the school book

1. Write each number in the appropriate column. Some may go in more than one column.

983

thirty-seven

six

0

9

seventy-five

2,300,540

one hundred

Digit	Number	Numeral

2. Circle all the numerals below.

seven

Xxxxxx

345

forty-nine

16 dogs

0

704

ten birds

1,343,342

addition

twenty-six

2

3. Vocabulary Building In your own words, write a brief definition of the terms digit, number and numeral.
-
-
-

4. Sara says that in the number 458 there are 3 digits. Do you agree or disagree? Explain.
-
-
-

5. Bassem says "the numeral 5,002 has 3 digits". Do you agree or disagree? Explain.

6. Write a numeral that has 4 digits. _____

7. Write a numeral that has 5 different digits. _____

8. Use the following digits to make the largest number possible and the smallest number possible.

a. 5, 8, 9, 2

• The largest number is _____

• The smallest number is _____

b. 3, 4, 1, 7, 5

• The largest number is _____

• The smallest number is _____

c. 3, 9, 0, 5, 7

• The largest number is _____

• The smallest number is _____

d. 2, 0, 3, 5, 6, 1

• The largest number is _____

• The smallest number is _____

9. Complete the following.

a. The largest 5-digit number is _____

b. The smallest 5-digit number is _____

c. The largest 5-different digit number is _____

d. The smallest 5-different digit number is _____

10. Write the place value and the value of the colored digit.

	place value	value
a. 69,284	[]	[]
c. 730,460	[]	[]
e. 24,378	[]	[]
g. 320,045	[]	[]
i. 59,730	[]	[]

	place value	value
b. 481,206	[]	[]
d. 156,392	[]	[]
f. 40,520	[]	[]
h. 501,483	[]	[]
j. 78,029	[]	[]

11. Compare. Write > or <.

a. 48,047	<input type="radio"/>	49,123	b. 175,362	<input type="radio"/>	175,290
c. 322,647	<input type="radio"/>	322,467	d. 321,054	<input type="radio"/>	83,266
e. 526,540	<input type="radio"/>	526,550	f. 50,320	<input type="radio"/>	50,410

12. Compare the numbers below and circle the greater.

23,410		22,999	111,223		101,345	4,890		4,891
--------	--	--------	---------	--	---------	-------	--	-------

13. Compare the numbers below and circle the smaller.

549,774		543,173	100,000		99,999	175,362		175,290
---------	--	---------	---------	--	--------	---------	--	---------

14. Writing About Math Consider the numbers 26, 260 and 62.

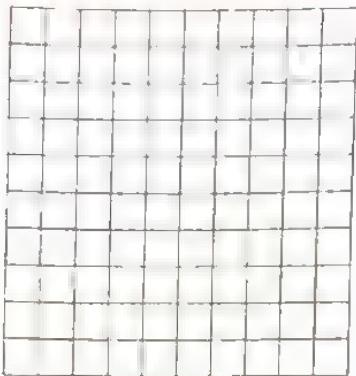
• Explain what strategies you would use to determine the greatest number.

Try to use the words digit, numeral, or number to explain your thinking. Be prepared to share your thinking.

Multiple Choice Questions

Choose the correct answer:

1. What number is represented in the picture?



- A. 36
C. 63

- B. 53
D. 67

2. How many different numbers are there in the picture?

x	1	2	3	4	5	6
1	1	2	3	4	5	6
2	2	4	6	8	10	12
3	3	6	9	12	15	18
4	4	8	12	16	20	24
5	5	10	15	20	25	30
6	6	12	18	24	30	36

- A. 12
C. 36
B. 18
D. 48

3. Roman Numerals are based on the following symbols:

X = 10, V = 5, and I = 1

So, the Roman Numeral XVI represents $10 + 5 + 1 = 16$

Using the same rule, what does LXV represent?

1	5	10	50	100	500	1000
I	V	X	L	C	D	M

- A. 55

- B. 56

- C. 61

- D. 65

4. How many digits does the numeral 30,693 have?

- A. 3

- B. 4

- C. 5

- D. 6

5. What is the value of the digit 3 in the numeral 439,102?

- A. 300

- B. 3,000

- C. 30,000

- D. 300,000

6. Which of the following numbers is the largest?

- A. 83,987

- B. 8,315

- C. 833,400

- D. 833,312

7. Which of the following is the least number possible formed from the digits: 2, 7, 0, 6, 4

- A. 2,467

- B. 20,647

- C. 20,467

- D. 764,20

Lesson

2

Really Big Numbers

1-3 Changing Values

1-4 Review Comparing Values

Pre-study Place-value chart through thousands

The least distance from the Earth to the Moon is about 384,402 kilometres.

The place-value chart shows this number.

PERIOD			PERIOD		
Thousands			Ones		
Hundreds	Tens	Ones	Hundreds	Tens	Ones
3	8	4	4	0	2
300,000	80,000	4,000	400	0	2



Each group of three digits is called a period. Each period has ones, tens, and hundreds in it. The number 384,402 has two periods, ones and thousands.



MATH IDEA Place-value and period names help you read and write numbers.



Standard Form : 384,402

Word Form : Three hundred eighty-four thousand, four hundred two.

Expanded Form : $300,000 + 80,000 + 4,000 + 400 + 2$

Examples

Standard form	Word form	Expanded form
40,915	forty thousand, nine hundred fifteen	$40,000 + 900 + 10 + 5$
607,304	six hundred seven thousand, three hundred four	$600,000 + 7,000 + 300 + 4$

Notes for parents :

- Let your child remember that he/she can use the expanded form as an easy way to read a number, for example $(2,000 + 600 + 30 + 4)$ is read as two thousand, six hundred thirty-four.

Learn Really big numbers

Million

There are about 1,000 words on a page of a newspaper.

With 1,000 words on a page,

10 pages have 10,000 words

100 pages have 100,000 words

1,000 pages have 1,000,000 words.

To show this number a period for Millions has to be added to the left of the thousands period in the place-value chart.



PERIOD			PERIOD			PERIOD		
MILLIONS			THOUSANDS			ONES		
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones
		1	0	0	0	0	0	0

Write : 1,000,000

Read : One million

One Million is a large number.

If you read 100 words a minute, it would take you almost 7 days nonstop to read 1,000,000 words.



More about millions

Egypt population in 2020 was 102,334,404
look at this number on the place-value chart.

PERIOD			PERIOD			PERIOD		
MILLIONS			THOUSANDS			ONES		
H	T	O	H	T	O	H	T	O
1	0	2	3	3	4	4	0	4
Hundred Millions place	Ten Millions place	Millions place	Hundred Thousands place	Ten Thousands place	Thousands place	Hundreds place	Tens place	Ones place

This number read as :

One hundred two million, three hundred thirty-four thousand, four hundred four.

or in a short way : 102 million, 334 thousand, 404

Math tip

The place-value chart helps you read greater numbers. You say "102" then at the comma you name the period, "million".

Notes for parents :

- Help your child to apply and extend understanding of the place value system to multi-digit whole numbers

Example 1

What is the place and value of each underlined digit?

583,460,905

Solution [V]**Milliard (Billion)**

China has the world's largest population
In 1980, the population of China reached
about 1,000,000,000



To show this number a column for
Milliards has to be added to the left
of the Millions period in
the place-value chart.

PERIOD				PERIOD				PERIOD			
MILLIARDS	MILLIONS			THOUSANDS			ONES				
Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones		
1	0	0	0	0	0	0	0	0	0		

Write : 1,000,000,000

Read : One milliard

One Milliard is a really large number.

- Ask your child to tell you the value and the place value of each digit in the number : 243,019,505.

More about milliards

Did you know the world's population in 2020 was over 7 milliards? It was about 7,794,798,739. Look at this number on the place-value chart.

PERIOD				PERIOD				PERIOD			
MILLIARDS	MILLIONS			THOUSANDS			ONES				
0	H	T	O	H	T	O	H	T	O		
7	7	9	4	7	9	8	7	3	9		

This number read as :

Seven milliard, seven hundred ninety-four million
seven hundred ninety-eight thousand,
seven hundred thirty-nine.

or in a short way :

7 milliard, 794 million, 798 thousand, 739



Example 2

In the numeral 3,418,079,265, what digit in the :

- a. Thousands place ?
- b. Ten Millions place ?
- c. Milliards place ?
- d. Hundred Thousands place ?

Solution

a. 9

b. 1

c. 3

d. 0

How to read a large number?

- ➊ Divide the number (from right to left) into "periods" each period contains 3 digits.

6 | 208 | 196,318

- ➋ Use the place-value chart to help you read the large number.

PERIOD				PERIOD				PERIOD			
MILLIARDS	MILLIONS			THOUSANDS			ONES				
0	H	T	O	H	T	O	H	T	O		
6	2	0	8	1	9	6	3	1	8		
6 milliard	208 million			196 thousand			318				

Notes for parents :

- Help your child to use periods to read multi-digit numbers in an easy way

Start from the left and read the number in each period followed by the period name as follows.

Reading

6,208,196,318

Six milliard, two hundred eight million,
one hundred ninety-six thousand, three hundred eighteen.

In a short way : 6 milliard, 208 million, 196 thousand, 318

Use the place value
chart to help you
reading numbers

Example 3

Match the cards that have the same numeral.

a. 43,509,458

b. 403,590,548

c. 4,103,905,484

d. 4,950,854

1. 4 milliard, 103 million, 905 thousand, 484
2. four million, nine hundred fifty thousand, eight hundred fifty-four
3. forty-three million, five hundred nine thousand, four hundred fifty-eight
4. 403 million, 590 thousand, 548

Solution

a. → 3

b. → 4

c. → 1

d. → 2



Check your understanding

1. In each of the following numerals :
 - underline the digit in the Hundred Thousands place.
 - circle the digit in the Ten Millions place.
 - draw a square around the digit in the Milliards place.
 2. Read the following numbers
- | | | |
|------------------|------------------|------------------|
| a. 7,561,492,048 | b. 7,914,500,721 | |
| a. 912,031,301 | b. 70,804,230 | c. 5,003,521,216 |

* Ask your child to write a number through milliard and then ask him/her to read it loudly.

Learn • Changing values



MATH IDEA The value of a digit depends on its place-value position in the number.

- The value of a digit changes as it moves to the left within a numeral.
- Our place-value system is based on tens.

Each place value in this system is 10 times greater than the one to the right of it.



Remember
A digit is one of the ten symbols 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9 used to write numbers

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
2	2	2	2	2	2	2
$2 \times 1,000,000$	$2 \times 100,000$	$2 \times 10,000$	$2 \times 1,000$	2×100	2×10	2×1
2,000,000	200,000	20,000	2,000	200	20	2

- A digit in one place represents 10 times as much as it represents in the place to its right.
- For example : the Hundreds place is 10 times greater than the Tens place, so the value of 2 changes from 20 to 200.
- Observe the pattern in the number of zeroes.

Example : Use place value chart to know the value of each digit.

MILLIONS			THOUSANDS			ONES		
H	T	O	H	T	O	H	T	O
1	4	9	5	9	8	0	0	0

- The value of the digit 8 in the Thousands place is 8,000
- The value of the digit 9 in the Ten Thousands place is 90,000
- The value of the digit 5 in the Hundred Thousand place is 500,000
- The value of the digit 9 in the Millions place is 9,000,000
- The value of the digit 4 in the Ten Millions place is 40,000,000
- The value of the digit 1 in the Hundred Millions place is 100,000,000

Notes for parents :

- Let your child understand that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.



The distance between the Earth and the Sun is about 149,598,000 km

Example 4

Fill in the blanks below.

- The value of the digit 3 in the number 7,431,210 is _____.
- The value of the digit 0 in the number 560,444,218 is _____.
- 7 in the Hundreds place is _____.
- _____ is 10 times greater than one hundred thousand.
- 30 tens equals _____.

Solution

- | | | |
|--------------|--|--|
| a. 30,000 | b. 0 | c. 700 (think : $7 \times 100 = 700$) |
| d. 1,000,000 | e. 300 (think : $30 \times 10 = 300$) | |

**Check your understanding**

- Fill in the blanks below.
 - The value of the digit 5 in the number 1,578,416,112 is _____.
 - The value of the digit 3 in the number 30,560,210 is _____.
 - _____ is 10 times greater than three hundreds.
- What is the value of the following :

a. 8 in the Tens place ? _____	b. 5 in the Ten Thousands place ? _____
c. 400 tens ? _____	d. 60 thousands ? _____
- How does the value of 5 change as it moves from the Hundreds place to the Thousands place ?

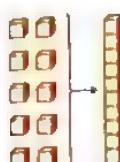
* Help your child to solve the questions of "check your understanding".



Learn Review comparing values

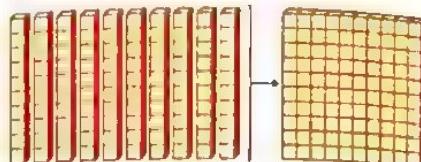
Think about the relationships among the Base-Ten blocks.

There are 10 ones in 10.



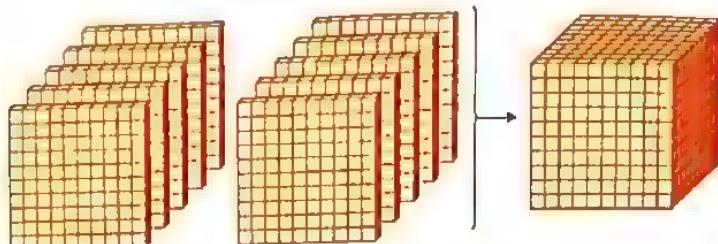
$$10 \equiv 10 \text{ ones } (10 \times 1)$$

There are 10 tens in 100.



$$100 = 10 \text{ tens } (10 \times 10)$$

There are 10 hundrededs in 1,000.



1,000 = 10 hundreds (10×100)

The blocks that represent numbers greater than 1,000 are too large to picture here. You can use the place-value chart to understand larger numbers.

Thousands			Ones		
Hundreds	Tens	Ones	Hundreds	Tens	Ones
					1
				1	0
			1	0	0
	1	0	0	0	0
1	0	0	0	0	0

Note that :

- 10 is 10 times greater than 1.
 - 100 is 10 times greater than 10.
 - 1,000 is 10 times greater than 100.
 - The value of the digit 1 represents 10 times as you move one place to the left on the place-value chart.

Examples for relationships between place values:

- The value of the Hundreds place is 10 times greater than the value of the Tens place.
 - The value of the Thousands place is 10 times greater than the value of the Hundreds place.
 - The value of Thousands place is 100 times greater than the value of the Tens place.

Notes for parents:

- Let your child describe the relationships between the place values, for example the value of the Thousands place is 10 times greater than value of Hundreds place .

Example 5

In the number 555,555 :

- In which place is the 5 has a value of 10 times greater than the 5 in the Hundreds place ?
- In which place is the 5 has a value of 100 times greater than the 5 in the Tens place ?
- In which place is the 5 has a value of 1,000 times greater than the 5 in the Hundreds place ?

Solution 

- a. Thousands place

THOUSANDS			ONES		
H	T	O	H	T	O
5	5	5	5	5	5



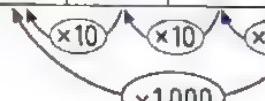
- b. Thousands place.

THOUSANDS			ONES		
H	T	O	H	T	O
5	5	5	5	5	5



- c. Hundred Thousands place.

THOUSANDS			ONES		
H	T	O	H	T	O
5	5	5	5	5	5


Example 6

- What is the number that is 1,000 times greater than 450 ?
- What is the number that is 100 times greater than 15 million ?

Solution 

- $450 \times 1,000 = 450,000$ (You may add three zeroes to 450)
- $15,000,000 \times 100 = 1,500,000,000$ (You may add two zeroes to 15 million)

* Ask your child how many times greater is the Hundreds place than the Tens place for the same digit ?
He/she should answer : 10 times.

Example 7

Fill in the blanks below.

- [4 tens and 8 ones] $\times 10 =$ _____
- [8 hundreds and 8 tens] $\times 100 =$ _____
- [3 thousands and 2 hundreds] $\times 1,000 =$ _____
- 78 thousands $\times 100 =$ _____

Solution 

- 480 → think : $(40 + 8) \times 10 = 48 \times 10 = 480$
- 88,000 → think : $(800 + 80) \times 100 = 880 \times 100 = 88,000$
- 3,200,000 → think : $(3,000 + 200) \times 1,000 = 3,200 \times 1,000 = 3,200,000$
- 7,800,000 → think : $(78,000 \times 100 = 7,800,000)$


 **Check** your understanding

1. In the number 33,333 :

- In which place is the 3 has a value of 100 times greater than 3 in the Hundreds place ? _____
- In which place is the 3 has a value of 1,000 times greater than the 3 in the Ones place ? _____

2. Fill in the blank below :

- The number that is 100 times greater than 12 million is _____
- The number that is 10 times greater than 125 million is _____
- [5 hundreds and 3 tens] $\times 1,000 =$ _____
- 35 ten thousands $\times 100 =$ _____

Notes for parents :

- Direct your child to solve "check your understanding" and tell how he/she solve each problem

Exercise 2

- 1-2 Really Big Numbers
 1-3 Changing Values
 1-4 Review Comparing Values

REMEMBER

INTERVALS

CHARTS

PROBLEM SOLVING

From the school book

1. Complete the table as in the example.

Number	BILLIARDS			MILLIONS			THOUSANDS			ONES		
	0	H	T	O	H	T	O	H	T	O	H	T
Ex. 5,604,453,987	5	6	0	4	4	5	3	9	8	7		
a. 8,714,326,518												
b. 753,009,300												
c. 7,354,621												
d. 8,000,300												
e. 923,508												

2. Write the value of the underlined digit according to its place in each number as in the example.

► Example. 47,209,531 → 40,000,000

- | | |
|-----------------------------|-----------------------------|
| a. 58, <u>4</u> 86,098 → | b. 3, <u>7</u> 84,168,411 → |
| c. <u>6</u> 2,478,300 → | d. 462, <u>4</u> 17 → |
| e. 24, <u>0</u> 41,683 → | f. 8,000, <u>4</u> 18,617 → |
| g. 41, <u>6</u> 91,403 → | h. 3 <u>2</u> 1,428,218 → |
| i. 669, <u>0</u> 84,422 → | j. 7,261, <u>9</u> 09 → |
| k. 30, <u>3</u> 03,333 → | l. 2, <u>1</u> 00,841,621 → |
| m. 7, <u>6</u> 23,102,481 → | n. 7 <u>1</u> 4,291 → |
| o. 5,555, <u>5</u> 55 → | p. 3 <u>2</u> 1,416,218 → |

3. Complete as the example.

► Example. The place value of the digit 7 in the number 7,321,521,800 is Milliards

a. The place value of the digit 0 in the number 5,321,041,758 is _____

b. The place value of the digit 2 in the number 9,152,747,180 is _____

c. The place value of the digit 8 in the number 4,821,400,006 is _____

d. The place value of the digit 4 in the number 748,263,501 is _____

4. In the numeral 234 568, what digit is in the

a. Tens place? _____

b. Hundred Thousands place? _____

c. One Thousands place? _____

5. Using the following number, complete the directions.

1,542,345,678

a. Underline the digit in the Ten Millions place.

b. Draw a square around the digit in the One Milliards place.

c. Circle the digit in the Hundreds place.

6. What is the value of each of the following.

a. 2 in the Tens place? _____

b. 7 in the Hundreds place? _____

c. 30 tens? _____

d. 60 thousands? _____

7. Fill in the blanks as in the example.

► Ex. • 23,800 = 238 hundreds.

75,000

• 750 hundreds = 75 thousands

a. 56,000 = _____ thousands.

b. 280,000 = _____ hundreds.

c. 25,600 tens = _____ thousands.

d. 300 thousands = _____ hundreds.

e. 55 thousands = _____ hundreds.

f. 850 thousands = _____ hundreds.

g. 72,000 tens = _____ thousands.

h. 87,900,000 hundreds = _____ millions.

8. Choose a digit between 1 and 9. Use this number to complete the charts.

BILLIARDS			MILLIONS			THOUSANDS			ONES		
O	H	T	O	H	T	O	H	T	O		

- My digit is _____
- Value of my digit in the Ones place _____
- Value of my digit in the Tens place _____
- Value of my digit in the Hundreds place _____
- Value of my digit in the Thousands place _____
- Value of my digit in the Ten Thousands place _____
- Value of my digit in the Hundred Thousands place _____
- Value of my digit in the Millions place _____
- Value of my digit in the Ten Millions place _____
- Value of my digit in the Hundred Millions place _____
- Value of my digit in the One Billiards place _____



9. Match the cards that have the same numeral.

a. 75,421,392

1. • 2 milliard, 500 million, 422 thousand,
300

b. 701,007,700

2. • Two million, five hundred thousand,
four hundred twenty-two.

c. 2,500,422,300

3. • 75 million, 421 thousand, 392

d. 2,500,422

4. • Seven hundred one million, seven
thousand seven hundred.

- 10.** Write a 9-digit number that has a 3 in the Ten Millions place, a 5 in the Hundred Thousands place, and a 2 in the Ones place. Is this the only number you could have written? Explain.
-

- 11.** Use the digits 5, 7, 3, 1, 8, 2, 9 and 6 to make the greatest number you can, then use the same digits to make the smallest number you can.

• The greatest is _____ • The smallest is _____

- How did the value of 7 change from the greatest number and the smallest number? Why did it change? Use words and numbers to explain your thinking.
-

- 12.** How are 12,940 and 120,940 similar?

- How are they different? Use words and numbers to explain your thinking.
-

- 13.** Is the digit 8 always worth 8 ():

Why or why not?

Use what you know about place value to support your answer.

- 14.** Sameh says: "In the number 5,555,555 all digits have the same value".

- Do you agree or disagree? Explain your thinking using numbers and words.
-

- 15.** How many?

- a. How many tens are there in one hundred? _____
- b. How many tens are there in one thousand? _____
- c. How many hundreds are there in one million? _____
- d. How many thousands are there in one million? _____
- e. How many hundreds are there in one milliard? _____
- f. How many tens are there in one million? _____

16. Complete as the example.

► Ex. [5 hundreds and 2 tens] $\times 10$ $500 \text{ and } 20 = 520, 520 \times 10 = 5,200$

a. [4 tens and 3 ones] $\times 10 =$

b. [5 hundreds and 7 tens] $\times 100 =$

c. [2 hundreds and 3 tens] $\times 10 =$

d. [3 thousands and 2 hundreds] $\times 100 =$

e. [7 thousands and 8 hundreds] $\times 100 =$

f. [4 ten thousands and 3 tens] $\times 100 =$

g. [5 hundred thousands and 7 hundreds] $\times 10 =$

h. [3 ten thousands and 4 thousands] $\times 100 =$



17. New Pharaoh Ant colonies form through a process called budding. Queens in existing colonies and several workers leave their nest to start new colonies elsewhere.

So, a colony that starts with 200 ants can quickly grow _____ times greater, to a size of 20,000 ants. (Complete)

18. A Pharaoh Ant colony can vary in size from a few dozen to several hundred thousand individuals. Imagine a Pharaoh Ant colony consisting of 333,333 ants !

a. In which place is the 3 has a value 10 times greater than the 3 in the Ten Thousands place ?

b. In which place is the 3 has a value 100 times greater than the 3 in the Ones place ?

19. How many times greater is the value of a number in the One Thousands place than the same number in the Tens place ? Use an example to support your thinking.

20. Fill in the blanks.

- is 10 times greater than one hundred thousand.
- is 10 times greater than two hundred.
- is 10 times greater than seven thousand.
- $56 \text{ thousands} \times 100 =$
- In the number 4,043, then 4 in the Tens place is times less than 4 in the Thousands place.

21. Amgad said that there are 300 hundreds in a 3,000. Do you agree or disagree?

Use what you have learned about place value to explain your thinking.

22. Ashraf says that the number 6,235,340 is exactly 1,000 less than the number 6,245,340

Do you agree? Explain how you know.

23. If there are 12 million Pharaoh Ants on the Kalahari and South America has 100 times as many Pharaoh Ants as the Kalahari, how many ants are in South America? Show your work

24. The number 147,976 has the digit 7 in two different places. How many times greater is the value represented by the 7 in the Thousands place than the value of the 7 in the Tens place?

Multiple Choice Questions

Choose the correct answer.

1. The place value of the digit 2 in the number 245,080,701 is

- A. Millions.
- B. Ten Millions.
- C. Hundred Millions.
- D. Hundred Thousands.

2. The value of the digit 5 in the number

- 2,456,300 is
- A. 5 millions.
- B. 50 millions.
- C. 50 thousands.
- D. 500 thousands.

3. 75 thousands

- 750 hundreds.

- A. >
- B. <
- C. =

4. _____ is 100 times less than one million.

- A. 100
- B. 1,000
- C. 10,000
- D. 100,000

5. 720 hundreds =

- tens.

- A. 720
- B. 7,200
- C. 72,000
- D. 720,000

6. [8 hundreds and 4 ones] \times 100 =

- A. 80,400
- B. 8,040
- C. 8,400
- D. 804,000

7. Bassem wrote the number 333,373,333

In which number below does the digit 7 have a value that is 1,000 times the value of the 7 in Bassem's number?

- A. 333,333,373
- B. 333,337,333
- C. 373,333,333
- D. 733,333,333

8. 102,000 = _____ hundreds.

- A. 1,020
- B. 1,200
- C. 102
- D. 10,200

9. The value of the digit 0 in the number

- 301,572,941 is _____
- A. 0
- B. 100
- C. 1,000
- D. 100,000

10. In which number does the 8 have a value of eight hundred?

- A. 538,419
- B. 781,015
- C. 271,825
- D. 419,782

11. The value of the 6 in 306,278 is 10 times the value of the 6 in which number?

- A. 21,637
- B. 360,541
- C. 412,016
- D. 521,367

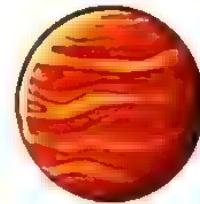
- | | |
|---|---|
| <p>12. 24,000 is times more than 2,400.</p> <p>A. 10 B. 100
C. 1,000 D. 10,000</p> | <p>13. The number that is 100 times greater than 560 is _____.</p> <p>A. 560 B. 5,600
C. 56,000 D. 560,000</p> |
| <p>14. The value of the 3 in 306,278 is 1,000 times the value of the 3 in which number?</p> <p>A. 21,637 B. 360,541
C. 413,016 D. 521,367</p> | <p>15. 4,000 is times less than 400,000.</p> <p>A. 100 B. 10
C. 1,000 D. 10,000</p> |
-
- 16.** Choose the number in which the digit 7 has the greatest value.
- A. 821,730,521 B. 152,007,000 C. 51,078,623 D. 7,810,521
-
- 17.** Berry drew the 7 cards with the digits shown below.
- 5 1 6 8 2 0 4
- If she uses each card only once, what is the greatest number possible with the digit 6 in the Tens place?
- A. 8,541,260 B. 8,542,160 C. 8,542,610 D. 8,654,210
-
- 18.** The number 348 is multiplied by 10. What is the value of the digit 4 in the product?
- A. The value of the digit 4 in the product is 4
B. The value of the digit 4 in the product is 40
C. The value of the digit 4 in the product is 400
D. The value of the digit 4 in the product is 4,000

1-5 Many Ways to Write

1-6 Composing and Decomposing

Learn Many ways to write numbers

The average distance between Jupiter and the sun is 778,340,821 km.



Place-Value Chart									
MILLIONS			THOUSANDS			ONES			
H	T	O	H	T	O	H	T	O	
7	7	8	3	4	0	8	2	1	

Standard Form: 778,340,821

"Commas are used to show periods"

Expanded Form: $700,000,000 + 70,000,000 + 8,000,000$
 $+ 300,000 + 40,000 + 800 + 20 + 1$

"Zeroes are not needed in expanded form because there is nothing in that place value; as 0 in Thousands place".

Word Form : Seven hundred seventy-eight million, three hundred forty thousand, eight hundred twenty-one.

"Commas are used to separate Millions, Thousands and Ones periods".

Short-Word Form : 778 million, 340 thousand, 821.

Notes

- We use standard form most often.
- Numbers written in expanded form show their full value.



Notes for parents :

- Your child may be confused about how to represent a place value with a 0 digit in expanded form. For example : $30,456 = 30,000 + 400 + 50 + 6$. The 0 is not represented in expanded form because in standard form the 0 represents that there is nothing in that place value.

Example 1

Write each number in standard form.

- $9,000,000,000 + 300,000,000 + 20,000,000 + 600,000 + 400 + 30$
- Three milliard, six hundred million, five hundred forty thousand, six hundred fifty.

Solution 

a. $9,320,600,430$

b. $3,600,540,650$

Example 2

Write each number in word form.

- 4,008,011,091
- $60,000,000 + 7,000,000 + 200,000 + 40,000 + 500 + 10 + 3$

Solution 

- Four milliard, eight million, eleven thousand, ninety-one.
- Sixty-seven million, two hundred forty thousand, five hundred thirteen.

**Check your understanding**

1. Write each number in standard form.

a. $5,000,000,000 + 70,000 + 1,000 + 40 + 9$ _____

b. Fifty-eight million, thirty-seven thousand, forteen. _____

2. Write the word form of the number 3,300,030,303
- _____

3. Write the expanded form of the number 7,608,490
- _____

Notes for parents :

Your child may struggle to say large numbers and need to be reminded to group the numbers into periods as they read them aloud.

Remind your child to use commas when writing numbers in the word form.

Learn Composing and decomposing numbers

- Composing numbers means [put together], and decomposing numbers means [broken apart].
- You can decompose the number 5,456,387 in different ways using place value chart:

MILLIONS			THOUSANDS			ONES		
H	T	O	H	T	O	H	T	O
		5	4	5	6	3	8	7

► 1st way: Expanded Form:

$$5,456,387 = 5,000,000 + 400,000 + 50,000 + 6,000 + 300 + 80 + 7$$

► 2nd way:

$$\begin{aligned} 5,456,387 = & [5 \times 1,000,000] + [4 \times 100,000] + [5 \times 10,000] + [6 \times 1,000] + [3 \times 100] \\ & + [8 \times 10] + [7 \times 1] \end{aligned}$$

Example 1

► Complete the following.

a. Composed: 8,035,402,176

Decomposed:

BILLIARDS		MILLIONS			THOUSANDS			ONES		
O	H	T	O	H	T	O	H	T	O	
—	—	—	—	—	—	—	—	—	—	

b. Composed:

$$\text{Decomposed: } [7 \times 1,000,000] + [9 \times 100,000] + [8 \times 1,000] + [2 \times 10] + [5 \times 1]$$

BILLIARDS		MILLIONS			THOUSANDS			ONES		
O	H	T	O	H	T	O	H	T	O	
—	—	—	—	—	—	—	—	—	—	

- Make sure that your child know the difference between the terms compose and decompose

Solution

a. Decomposed: $(8 \times 1,000,000,000) + (3 \times 10,000,000) + (5 \times 1,000,000) + (4 \times 100,000)$
 $+ (2 \times 1,000) + (1 \times 100) + (7 \times 10) + (6 \times 1)$

b. Composed: 7,908,025

BILLIARDS				MILLIONS				THOUSANDS				ONES			
B	M	I	L	M	A	R	S	T	H	O	U	H	T	O	N
0		H	T	0		H	T	0	H	T	0		H	T	0
				7		9	0	8	0		2		5		

Example 2

Example – Decompose the following numerals using expanded form.

Solution

- a. $300,000 + 40,000 + 50 + 1$ b. $3,000,000 + 400,000 + 9,000 + 700 + 30 + 5$
c. $20,000,000 + 3,000,000 + 200,000 + 800 + 40 + 1$

 **Check** your understanding

► Complete the following.

- 1. Compose : 7,504,092,415**

Decompose:

- ### **2. Compose:**

$$\text{Decompose: } [3 \times 1,000,000,000] + [2 \times 100,000,000] + [5 \times 10,000,000]$$

$$+ [4 \times 100,000] + [7 \times 10,000] + [8 \times 1,000] + [6 \times 10] + [9 \times 1]$$

Notes for parents :

- Make sure that your child knows how to represent a zero in a place when the number is decomposed

Exercise 3

1-5 Many Ways to Write 1-6 Composing and Decomposing

REMEMBER

UNDERSTAND

ANALYSE

PROBLEM SOLVING

From the school book

1. Write the expanded form of each of the following.

a. 1. 50,391

b. 740,821

c. 1,756,300

d. 54,632,405

e. 701,462,051

f. 9,989,791,985

2. Write each number in standard form.

a. 1 Three hundred seventy.

b. 16 million, 201 thousand, 856.

c. 439 million, 898 thousand, 13.

d. Sixty-three million, seven hundred ninety-six thousand, nine hundred three.

e. Five hundred twenty-seven million, nine hundred thousand, six hundred forty.

f. Three milliard, four hundred two million, seventeen.

g. $20,000 + 7,000 + 400 + 20 + 2$.

h. $1,000,000,000 + 400,000,000 + 3,000,000 + 20 + 5$.

i. $700,000,000 + 30,000 + 1,000 + 500 + 40$.

3. Write each number in word form.

a. 1148

b. 507

c. $567,421$

d. $3,562,504$

e. $54,213,450$

f. $911,394,116$

g. $5,408,921,002$

h. $700,000 + 60,000 + 20 + 9$

i. $5,000,000,000 + 7,000,000 + 900,000 + 3,000 + 20$

j. $900,000,000 + 60,000,000 + 6,000,000 + 40,000 + 600 + 5$

k. $5,000,000,000 + 700,000,000 + 30,000,000 + 800,000 + 9,000 + 10 + 7$

4. Complete the following.

a. $700,005,009 =$ seven hundred _____, five _____, nine.b. $4,030,400,050 =$ _____ milliard, _____ million, _____ thousand,c. $417,900,770 =$ seventeen million, nine hundred _____, _____, seventyd. $2,100,080,005 =$ milliard, one _____, eighty _____, five.

e. $52,376 =$ fifty two thousand, three hundred
 $= +2,000 + +70 +$

f. $345,61 = +40,000 + 5,000 + 100 + 60 + 1$
= three hundred forty thousand, one hundred

5. Complete the following.

a. Composed:

Decomposed: $[7 \times 10,000] + [8 \times 1,000] + [5 \times 100] + [2 \times 10] + [6 \times 1]$

MILLIARDS	MILLIONS			THOUSANDS			ONES		
0	H	T	O	H	T	O	H	T	O

b. Composed: 309,431

Decomposed:

MILLIARDS	MILLIONS			THOUSANDS			ONES		
0	H	T	O	H	T	O	H	T	O

c. Composed:

Decomposed:

MILLIARDS	MILLIONS			THOUSANDS			ONES		
0	H	T	O	H	T	O	H	T	O
2	8	0	5	4	0	0	6	9	3

d. Composed: 7,052,318,709

Decomposed:

MILLIARDS	MILLIONS			THOUSANDS			ONES		
0	H	T	O	H	T	O	H	T	O

e. Composed:

Decomposed:

MILLIARDS	MILLIONS			THOUSANDS			ONES		
O	H	T	O	H	T	O	H	T	O
3	2	0	9	5	0	0	7	0	8

6. Decompose the following numerals using expanded form.

a. 170,392 = _____ + _____ + _____ + _____ + _____

b. 105,208 = _____ + _____ + _____ + _____

c. 3,456,209 = _____

d. 2 million, 277 thousand, 191 = _____

e. 35 million, 17 thousand, 230 = _____

f. 17 million, 230 thousand, 14 = _____

g. Three milliard, one hundred thirty-seven million, six hundred nineteen thousand, eighty-eight = _____

h. Two milliard, four hundred twenty million, three hundred fifty-two thousand, one hundred three = _____



Challenge

7. Write 16 ten thousands + 5 thousands + 64 tens in standard form = _____

8. Find two 9-digit numbers with the difference between them is one million.
and _____

Multiple Choice Questions

Choose the correct answer.

1. What is the standard form for
 $3,000,000 + 500,000 + 50$?
A. 355 B. 3,500,500
C. 3,500,050 D. 3,005,005
2. Which of the following shows the numeral "five milliard, four hundred twenty-six thousand" in standard form?
A. 5,000,426 B. 5,426,000
C. 5,000,426,000 D. 5,426,000,000
3. Which of the following represents the number 4,305,082 written in expanded form?
A. $4,000,000 + 300,000 + 50,000 + 800 + 2$
B. $4,000,000 + 300,000 + 50,000 + 80 + 2$
C. $4,000,000 + 30,000 + 5,000 + 800 + 2$
D. $4,000,000 + 300,000 + 5,000 + 80 + 2$
4. Which is the correct way to write the numeral 25,702 in word form?
A. twenty-five, seven hundred two.
B. twenty-five thousand, seven hundred two.
C. twenty-five ten thousand, seven hundred two.
D. twenty-five thousand, seventy-two.
5. Which expression decomposes the numeral 50,374 in expanded form?
A. $50,000 + 300 + 70 + 4$
B. $50,000 + 3,000 + 70 + 4$
C. $50,000 + 3,000 + 700 + 4$
D. $5,000 + 300 + 70 + 4$
6. Which is a compose to $[7 \times 10,000] + [2 \times 10] + [4 \times 1]$?
A. 724 B. 70,240
C. 7,024 D. 70,024
7. Which numeral and phrase are ways of writing the number that is composed of
3 ten thousands, 5 hundreds, and 2 ones? Select two correct answers.
A. 310,521 B. 30,520 C. 30,502
D. three hundred ten thousand, five hundred twenty one.
E. thirty thousand, five hundred two.
F. thirty thousand, five hundred twenty.

Concept 1 Assessment | Unit 1



1. Put (✓) to the correct answer and (✗) to the incorrect answer.

- a. The largest 5-digit number is 98,765 []
- b. The place value of the digit 9 in the number 891,782 is Hundred Thousands. []
- c. $400 \text{ thousands} = 4,000 \text{ hundreds}$. []
- d. $[4 \text{ thousands and } 3 \text{ hundreds}] \times 100 = 43,000$ []
- e. In the number 7,073 the 7 in the Tens place is 100 times less than the 7 in the Thousands place. []
- f. 8 in Thousands place is 80,000 []

2. Choose the correct answer.

- a. The value of the digit 5 in the number 52,789 is 10 times the value of the digit 5 in which numbers?
 - A. 36,563
 - B. 45,642
 - C. 27,951
 - D. 502,622
- b. $314,562$ _____ $47,998$
 - A. >
 - B. <
 - C. =
- c. The value of the digit 0 in the number 301,526,432 is _____.
 - A. 1,000
 - B. 10,000
 - C. 10,000,000
 - D. 0
- d. 350,000 is _____ times more than 35,000.
 - A. 10
 - B. 100
 - C. 1,000
 - D. 10,000
- e. In which number does the 4 have a value of four thousands?
 - A. 403,562
 - B. 345,263,651
 - C. 165,174,232
 - D. 1,426,005,791
- f. Which statement explains how the value of the 6 in the numbers 360 and 3,600 are different?
 - A. 360 is 100 times less than 3,600
 - B. 360 is ten times greater than 3,600
 - C. 3,600 is 100 times greater than 360
 - D. 3,600 is ten times greater than 360

3. Complete.

- a. The value of the digit 1 in the number 1,324,072,569 is _____.
- b. 38 thousands = _____ hundreds.
- c. $[3 \text{ hundred thousands and } 8 \text{ tens}] \times 10 =$ _____.

- d. is 10 times greater than three hundred thousand.
- e. The number 257 is multiplied by 1,000, then the new value of the digit 5 in the product is .
- f. In the number 324,312 the 3 in the Hundred Thousands place is the value of the 3 in the Hundreds place.

4. Match the cards that have the same numeral.

a. 2,743,562

1. 2 milliard, 743 thousand, 562

b. 2,000,743,562

2. twenty million, seven hundred forty-three thousand, five hundred sixty-two

c. 20,743,562

3. 2 million, 743 thousand, 562

d. 2,743,562,000

4. two milliard, seven hundred forty-three million, five hundred sixty two thousands

5. Ahmed wrote the number 146,152,780. The answer is 6,000,000. What is the question ?

6. What number is twice the value of the Ten Thousands digit in 423,008 ?

7. Write a number in which the value of the digit 4 in the number 41,792 is 10 times the value of a digit 4 in your number.

8. Ashraf said that 24,613,351 is one million more than 14,613,351. Describe his error.

9. The number 863 is multiplied by 1,000. What is the new value of the digit 6 in the product ?

10. The number 341,426 has the digit 4 in two different places. How many times greater is the value represented by the 4 in Ten Thousands place than the value of the 4 in the Hundred place ?

11. How many thousands are there in one million ?

12. Use the words in the box to complete the sentence.

In _____, numbers are separated by commas into groups of three digits, called

Words to know

periods
standard form
expanded form

Concept

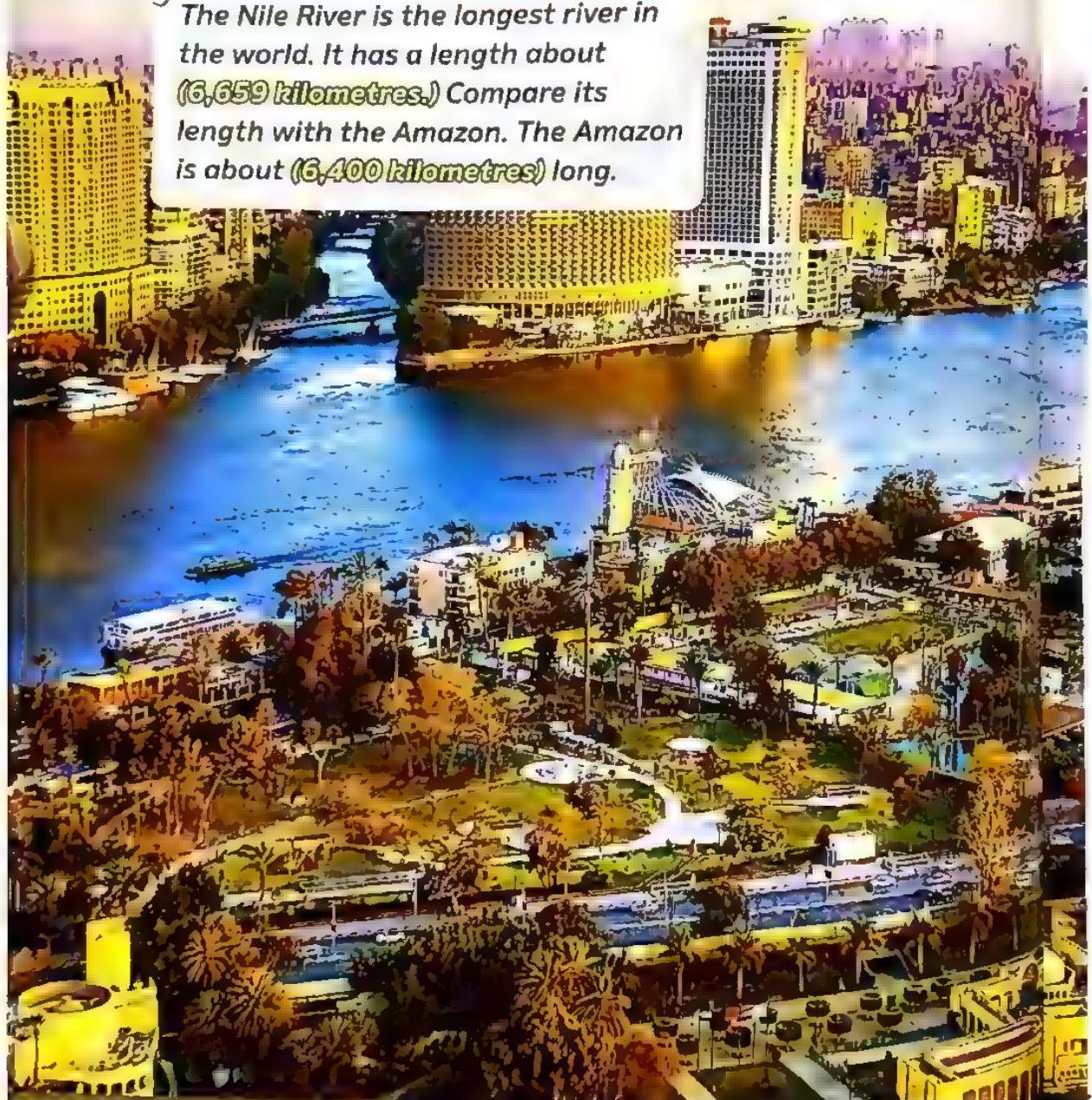
2

Using Place Value



Fast Fact

The Nile River is the longest river in the world. It has a length about (6,659 kilometres.) Compare its length with the Amazon. The Amazon is about (6,400 kilometres) long.



Concept Overview

In concept 2 :

Using Place Value, students apply what they have learned about place value to compare and order very large numbers. Students build understanding of the importance of place value in reading, writing, and understanding numerals to the one Milliard place and in estimating. Students review the purpose of estimation and practise two strategies, "front-end estimation and rounding using place value" and determine which strategy provides the most accurate estimates. These place value concepts help students master more challenging concepts in primary 4, including multiplication, division, fractions and decimals.



Lesson No	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 4	1-7 Review Comparing Really Big Numbers	Compare - Less than - Greater than - Equal to	<ul style="list-style-type: none">Students will use place value to compare large numerals.Students will use symbols to express numerical comparisons.
	1-8 Comparing Numbers in Multiple Forms	Decomposed form - Expanded form - Standard form - Word form	<ul style="list-style-type: none">Students will compare numbers in multiple forms.Students will describe strategies for comparing numbers in multiple forms.
Lesson 5	1-9 Descending and Ascending Numbers	Ascending - Descending - Order - Compare - Decomposed form - Expanded form - Standard form - Word form	<ul style="list-style-type: none">Students will order numbers in multiple forms.Students will describe strategies for ordering numbers in multiple forms.
Lesson 6	1-10 Predicting the Unpredictable	Estimation - Front-end estimation - Reasonable	<ul style="list-style-type: none">Students will explain front-end estimation.Students will use front-end estimation to approximate large numbers.
	1-11 Rounding Rules	Estimation - Rounding - Nearest - Reasonable - Accurate	<ul style="list-style-type: none">Students will apply multiple strategies to round numbers.Students will discuss whether rounding or front-end estimation provide a more accurate estimate.



1-7 Review Comparing Really Big Numbers

1-8 Comparing Numbers in Multiple Forms

Learn Comparing large numbers

Bassem turned a spinner five times and called out one digit each time. Sara and Mina each wrote a 5-digit number.

Sara 1 2 , 6 7 3 Mina 1 2 , 7 6 3



- How can you tell who wrote the greater number?
- You can compare two numbers with the same number of digits by starting at the left and moving right until you come to a pair of digits that do not have the same value.

Compare 12,673 and 12,763. Start at the left. Check each place until the digits are different.

Step 1

Compare the Ten Thousands.

12,673

↓
same number of
Ten Thousands

12,763

Step 2

Compare the Thousands.

12,673

↓
same number of
Thousands

12,763

Step 3

Compare the Hundreds.

12,673

↓
7 > 6

12,763

Since $12,763 > 12,673$ Mina wrote the greater number.

 **Remember**

When comparing numbers, the number which has more digits is the greater.

Example : **5,302,200 > 899,529**

because 5,302,200 has more digits than 899,529

Notes for parents :

- Ask your child to consider how many digits are in a numeral when he/she compares

More Examples

• 754,042 < 755,950

• 42,437 > 42,347

• 755,972 < 1,752,421

• 6,406,367 = 6,406,367

Example 1

Write [>, < or =] to compare. Circle the first digit in each number that helps you determine which number is greater.

a. 37,048 ○ 37,184

b. 217,906 ○ 271,906

c. 4,010,065 ○ 4,000,056

d. 810,340 ○ 810,340

Solution 

a. 37,048 < 37,184

b. 217,906 < 271,906

c. 4,010,065 > 4,000,056

d. 810,340 = 810,340

**Check your understanding**

Write [>, < or =] to compare. Circle the first digit in each number that helps you determine which number is greater.

a. 2,346 ○ 2,338

b. 478,765 ○ 479,112

c. 723,215 ○ 723,215

d. 752,321,271 ○ 72,321,271

e. 503,278,105 ○ 503,279,100

f. 7,492,102,235 ○ 7,491,102,235

- If your child has difficulty making comparisons let he/she first circle the place where the digits are different.

Learn**Comparing numbers in multiple forms**

- You have studied before how to write numbers in different forms: standard, expanded and word form.
- You can compare numbers in any forms.
- You may convert to standard form to compare, or use place value in expanded form or in word form to compare.

Example 2Write [$>$, $<$ or $=$] to compare:

a. $70,000 + 4,000 + 50 + 7$



$70,000 + 4,000 + 500 + 70$

b. Two milliard, seven hundred thirty-eight thousand, ten.



Two milliard, seven hundred thirty-five thousand, eleven.

c. $3,000,000 + 7,000 + 800 + 9$



Three million, seven thousand, eight hundred nine.

d. $[7 \times 1,000,000] + [5 \times 100,000] + [3 \times 1,000] + [4 \times 100] + [9 \times 1]$



$7,000,000 + 500,000 + 3,000 + 400 + 90$

Solutiona. $<$ b. $>$ c. $=$ d. $<$ **Check your understanding**Write [$>$, $<$ or $=$] to compare.

a. $500,000 + 70,000 + 90 + 8$



$1,000,000 + 5,000 + 1$

b. Three milliard, two hundred fifty-two thousand, three hundred four.



Three milliard, two hundred fifty-two thousand, thirty-four.

c. $[8 \times 1,000,000] + [6 \times 1,000] + [5 \times 100] + [7 \times 10]$



$[8 \times 1,000,000] + [2 \times 10,000] + [6 \times 1,000] + [5 \times 100] + [9 \times 1]$

d. $2,000,000,000 + 400,000,000 + 2,000 + 30 + 2$



$2,000,000,000 + 50,000,000 + 8,000,000 + 9,000 + 50 + 9$

Notes for parents :

- Your child may struggle with comparing numbers in word form or expanded form. He/she may convert to standard form to compare.

Exercise **4**

1-7 Review Comparing Really Big Numbers

1-8 Comparing Numbers in Multiple Forms

REMEMBER

PROBLEM SOLVING

... From the school book

1. Compare. Write ($>$, $<$ or $=$).

- | | | | | | |
|--------------------|-----------------------|------------------|------------------|-----------------------|---------------|
| a. 707 | <input type="radio"/> | 770 | b. 1,207 | <input type="radio"/> | 1,207 |
| c. 10,525 | <input type="radio"/> | 10,255 | d. 190,098 | <input type="radio"/> | 19,098 |
| e. 291,074 | <input type="radio"/> | 219,704 | f. 9,854,705 | <input type="radio"/> | 11,012,314 |
| g. 5,680,421,226 | <input type="radio"/> | 5,598,672,565 | h. 7,798,562,415 | <input type="radio"/> | 7,798,567,999 |
| i. 89,418,147 | <input type="radio"/> | 89,418,247 | j. 571,600,254 | <input type="radio"/> | 571,600,329 |
| k. 940,668 | <input type="radio"/> | 940,669 | l. 1,000,000,000 | <input type="radio"/> | 900,000,000 |
| m. 100,000,000 | <input type="radio"/> | 99,999,999 | n. 40,000 | <input type="radio"/> | 400 thousands |
| o. 7 ten thousands | <input type="radio"/> | 7,000 | p. 5,000 | <input type="radio"/> | 500 thousands |
| q. 9 thousands | <input type="radio"/> | 9,000 | r. 7100,600,200 | <input type="radio"/> | 8 billions |
| s. 3 billions | <input type="radio"/> | 300 ten millions | | | |

2. Compare. Write ($>$, $<$ or $=$).

- | | | | |
|----|---|-----------------------|---|
| a. | 7,000 millions | <input type="radio"/> | 7 billions |
| b. | 14,617 | <input type="radio"/> | 10,000 + 4,000 + 600 + 20 |
| c. | 5 billions, 367 thousand | <input type="radio"/> | 5,367,000,000 |
| d. | Ninety-seven million, three hundred one | <input type="radio"/> | 90,000,000 + 7,000,000 + 3,000 + 1 |
| e. | 5,193,492,500 | <input type="radio"/> | five billion, three hundred million, seven hundred fifteen thousand, thirty-four. |
| f. | $[7 \times 100,000,000] + [4 \times 10,000,000] + [9 \times 10,000] + [8 \times 100] + [1 \times 10]$ | <input type="radio"/> | 70,000 + 9,000 + 600 + 40 + 3 |

g. 8,040,761,903

$8,000,000,000 + 400,000,000 + 700,000 + 60,000 + 1,000 + 900 + 3$

h. $4,000,000,000 + 5,000 + 1$

$4,000,000 + 70,000 + 10$

i. Seventeen million, four hundred twenty-five thousand, six hundred five.

$[1 \times 10,000,000] + [7 \times 1,000,000] + [4 \times 100,000] + [2 \times 10,000] + [6 \times 100] + [5 \times 1]$

j. Four hundred twenty-three thousand, twelve

$400,000 + 30,000 + 2,000 + 20 + 1$

3. Tell whether each statement is true or false.

a. $4,581 > 4,000 + 800 + 50 + 1$

True

b. $40 \text{ hundreds} + 50 \text{ tens} + 81 \text{ ones} = 4,581$

c. $4 \text{ thousands} + 8 \text{ hundreds} + 1 \text{ ten} + 5 \text{ ones} > 4,581$

d. $5,000,000 + 400,000 + 10,000 + 6,000 + 300 + 7 < 5,416,370$

e. $50 \text{ hundreds} + 40 \text{ tens} + 81 \text{ ones} = 4,581$

f. $50 \text{ thousands} + 8 \text{ hundreds} + 1 \text{ ten} + 4 \text{ ones} < 50,418$

4. Find each missing digit.

a. $6,106 > 6, \underline{1} 9$

b. $2,117 = \underline{1},117$

c. $4,382 < 4,3 \underline{2}$

d. $91,472 > 9 \underline{1},472$

e. $114,899 < 114, \underline{9} 9$

f. $703,9 \underline{1} = 703,981$

g. $11,234 > 1 \underline{1},785$

h. $67,813 > 67,8 \underline{3}$

i. $82, \underline{8} 8 = 82,588$

j. $179,00 \underline{0} < 179,001$

k. $856, \underline{3} 4 < 856,134$

l. $683,129 < 6 \underline{3},129$

5. Find all the digits that can replace each $\underline{\quad}$.

a. $9 \underline{7},536 < 957,549$

b. $423, \underline{9} 6,517 < 423,695,815$

c. $84,41 \underline{1},811 < 84,413,604$

d. $24, \underline{6} 2 > 24,701$

e. $7,00 \underline{1},852,314 < 7,007,864,718$

6. Create numbers that make the comparison true. Use all the lines.

a. < 890,789,000

b. 642,578,291 >

c. 2,456,800,900 >

d. 4,748,562,700 <

e. < 3,784,562,931

7. Write a number.

a. Create a numeral that is less in the Hundred Thousands place than (<) 612,793

b. Create a numeral that is less in the Hundred Thousands place than (<) 893,820

c. Create a number that is greater in the Millions place than (>) 8,933,001

d. Create a numeral that is greater in the Hundred Millions place than (>) 247,854,923

e. Create a numeral that is less in the Ten Millions place than (<) 32,427,400

f. Create a number that is greater in the Milliards place than 5,555,555,555

g. Write a numeral in expanded form that is equal (=) 2,445,232,197

h. Create a numeral that is less in the Thousands place than (<) 735,872

i. Create a numeral that is greater in the Ten Thousands place than (>) six milliard, four hundred million, seven hundred twenty thousand, nine hundred eleven.

j. Create a numeral that is greater in the Millions place than (>) $50,000,000 + 2,000,000 + 700 + 30$

k. Create a numeral that is greater in the Ten Thousands place than (<) $3,000,000,000 + 400,000,000 + 400,000 + 2,000 + 300 + 2$

l. Create a numeral that is greater in the Milliards place than (>) 3,456,789,000

Challenge

8. Which is greater, the number that is 1,000 less than 13,495 or the number that is 10,000 less than 23,495?

9. Describe the error in the following number sentence, and then explain how you would correct it. $24,152,614 < 24,125,614$

Multiple Choice Questions

Choose the correct answer.

1. $785,743$ $794,832$

A. >

B. <

C. =

2. $83,754$

100,000

A. >

B. <

C. =

3. $100,000,040$

One hundred

million, forty.

A. >

B. <

C. =

4. Which number sentence is TRUE?

A. 300 thousand < 99,900

B. $62,889 > 104,772$

C. $150,600 > 100,000 + 50,000 + 6$

D. $7,569,120 > 7,569,210$

5. Which number sentence is NOT TRUE?

A. $2,304 < 2,340$

B. $27,920 > 27,790$

C. $1,005,301 > 1,050,901$

D. $80,044 < 80,404$

6. Which digit makes the number sentence

TRUE?

$4,201,351 > 4,20\text{ } ,351$

A. 3

B. 2

C. 1

D. 0

7. Which of the following digits makes the number sentence TRUE?

$754,321 < 7\text{ }4,321$

A. 3

B. 4

C. 5

D. 6

8. Which of the following numeral makes the sentence TRUE?

Two milliard, three hundred forty-five thousand < _____

A. 2,344,000

B. 2,000,345

C. 2,001,345,000

D. 2,000,345,000

9. Which of the following numerals is greater than this numeral

" $3,000,000 + 500,000 + 300 + 70 + 2$ "?

A. 3,005,372

B. 3,500,732

C. 3,500,273

D. 3,005,732

10. Which of the following numerals is less than this numeral

"40 million, 900 thousand, 508"?

A. 49,000,508

B. 40,900,508

C. 40,009,580

D. 40,900,580

1-9 Descending and Ascending Numbers

Learn Ordering numbers

The table shows the population of four governorates in Egypt in 2021. You can order the governorates by their population from greatest to least as follows :

1. The number 10,058,942 has the most number of digits, so it is the greatest number.
2. The number 450,528 has the least number of digits, so it is the least number.
3. Compare 5,452,718 and 5,510,876 which have the same number of digits.



Governorate	Population
Cairo	10,058,942
North Sinai	450,528
Alexandria	5,452,718
Souhag	5,510,876

Check each place until the digits are different.

Step 1

Compare the Millions.

5,452,718

↓
same number
of Millions

5,510,876

Step 2

Compare the Hundred Thousands.

5,452,718

↓
5,510,876

} 5 > 4

Then : 5,510,876 > 5,452,718

From above :

10,058,942 > 5,510,876 > 5,452,718 > 450,528

- In order of their population the governorates are Cairo, Souhag, Alexandria and North Sinai.

Notes for parents :

- Remind your child to start comparison at the greatest place value

Example 1

Order these numbers from least to greatest.

2,896,016

1,188,580

1,517,550

Solution

Step 1 ➔ Write the numbers, lining up places. Compare

2,896,016 ← greatest

1,188,580

1,517,550

Step 2 ➔ Write the remaining numbers, lining up places. Compare.

1,188,580

1,517,550 ← greater

Step 3 ➔ Write the numbers from least to greatest.

1,188,580 1,517,550 2,896,016

Example 2

Write each of the following numerals in standard form and arrange in a descending order.

- $[7 \times 1,000,000,000] + [4 \times 10,000,000] + [5 \times 1,000] + [3 \times 100]$
- Seven milliard, four hundred million, one thousand, two
- $7,000,000,000 + 500,000,000 + 600,000 + 300$
- 745,300

**Remember**

Descending order is ordering numbers from greatest to least.

**Solution**

Standard form	Descendingly
7,040,005,300	7,500,600,300
7,400,001,002	7,400,001,002
7,500,600,300	7,040,005,300
745,300	745,300

Notes for parents :

- If your child has trouble ordering numbers, ask him/her to align the numbers vertically and compare digits left to right.

Example 3

Arrange the following in a descending order, using the forms in which the numbers are written.

- Seven milliard, three hundred forty thousand, two
- 7,340,200
- $(7 \times 1,000,000) + [3 \times 100,000] + [4 \times 10,000] + [9 \times 10]$
- $7,000,000,000 + 3,000,000 + 20$

Solution (you may write each number in standard form to facilitate the solution)

The order is : $7,000,000,000 + 3,000,000 + 20$

- , seven milliard, three hundred forty thousand, two
- , 7,340,200
- , $(7 \times 1,000,000) + [3 \times 100,000] + [4 \times 10,000] + [9 \times 10]$

Example 4

Write a numeral that is greater than 7,856,342 and a numeral that is less than 7,856,342 and write the three numerals in an ascending order.

Solution

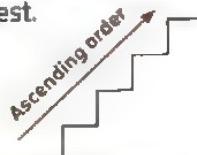
The greater numeral is : 7,856,343 "You may write other numerals"

The smaller numeral is : 7,856,341 "You may write other numerals"

The order is : 7,856,341 , 7,856,342 , 7,856,343

**Remember**

Ascending order is ordering numbers from least to greatest.



Check your understanding

Arrange the following in a descending order, using the standard form.

- Three milliard, forty million, seventy-one thousand, ten.
- $[3 \times 1,000,000,000] + [5 \times 1,000,000] + [7 \times 1,000] + [1 \times 100] + [1 \times 10]$.
- $3,000,000,000 + 30,000,000 + 10$
- 3,300,710,400

Solution

- Remind your child about the meaning of the two terms ascending order and descending order.

Exercise

5

1-9 Descending and Ascending Numbers

REMEMBER

UNDERSTAND

ONLY

PROBLEM SOLVING

From the school book

1. Write the numbers in an ascending order.

a. 7,122,890 , 700,122,089 , 70,122,098 , 7,120,980

The order is: _____ , _____ , _____ , _____

b. 3,452,805 , 3,542,805 , 542,905 , 1,000,000,000

The order is: _____ , _____ , _____ , _____

c. 430,000,459 , 43,000,549 , 403,000,456 , 430,549,000

The order is: _____ , _____ , _____ , _____

d. 2,000,751,240 , 2,100,101,240 , 2,010,010,860 , 299,782,561

The order is: _____ , _____ , _____ , _____

2. Write all of the digits that can replace each _____.

a. 567 < 5 _____ < 582 _____

b. 3,408 < 3, _____ 30 < 3,540 _____

c. 52,780 > 5 _____ ,790 > 50,120 _____

d. 4,464,545 > 4,4 _____ 3,535 > 4,443,550 _____

3. Write each of the following numerals in standard form and arrange the numerals in an ascending order.

a. • Three hundred fifty-two thousand, sixty-seven

• 3,052,100

• $(3 \times 100,000) + [5 \times 10,000] + [2 \times 1,000] + [6 \times 100] + [2 \times 10]$

• Three hundred sixty-seven thousand, two hundred one.

Standard form	Ascending order

- b. • $3,000,000 + 400,000 + 5,000 + 3$
 • Three million, four hundred fifty thousand, three
 • 3,453,000
 • $[3 \times 1,000,000] + [4 \times 100,000] + [5 \times 10,000] + [3 \times 10]$

Standard form	Ascending order

- c. • Two milliard, four million, seven hundred thousand
 • 2,400,700,000
 • $[2 \times 1,000,000,000] + [4 \times 10,000,000] + [7 \times 1,000]$
 • Three milliard

Standard form	Ascending order

- d. • Five milliard, one hundred million, sixty-four
 • 99,137,563
 • $5,000,000,000 + 10,000,000 + 70 + 8$
 • $[5 \times 1,000,000,000] + [1 \times 100,000,000]$

Standard form	Ascending order

- e. • Three hundred sixty-two thousand, four hundred ninety-one
 • 363,906
 • $[3 \times 100,000] + [6 \times 10,000] + [2 \times 1,000] + [8 \times 100] + [8 \times 10]$
 • $300,000 + 60,000 + 4,000 + [9 \times 10]$
 • Three hundred sixty-three thousand, five hundred eighty-nine

Standard form	Ascending order

- f. • Six hundred million, four thousand, eighty-five
 • $6,000,000 + 400,000 + 90 + 9$
 • 6,0743,000
 • Sixty million, seven hundred thousand
 • $[9 \times 1,000,000,000] + [7 \times 100]$

Standard form	Ascending order

4. Arrange in a descending order, using the forms in which the numbers are written.

- a. • Five milliard, six hundred thousand, four. • 561,040
- Five milliard, sixty thousand, four hundred.
- $[5 \times 1,000,000,000] + [4 \times 100,000] + [6 \times 10]$ • 6,600,000

The order is :

b. • Nine million, seven hundred thirty-one thousand, seventy.

- 90,731,007
- $[9 \times 100,000,000] + [8 \times 10,000] + [5 \times 100]$
- $9,000,000 + 700,000 + 40,000 + 50$
- Seven hundred million, eighty-four.

The order is :

c. • $7,000,000,000 + 400,000,000 + 70,000 + 300 + 9$

- Seven milliard, fifty-three thousand, seventy-eight.
- 8,000,000,000 • Seven milliard, two hundred million, nine
- $[7 \times 1,000,000,000] + [5 \times 100,000,000] + [9 \times 100]$

The order is :

d. • $[2 \times 1,000,000,000] + [5 \times 10,000,000] + [3 \times 1,000] + [6 \times 1]$

- Two milliard, five hundred million, two thousand.
- 2,543,269
- Five million, four hundred thousand, seventy-one
- $2,000,000,000 + 2,000,000 + 500$

The order is :

5. Create a numeral that is greater than 980,622 and a numeral that is less than 980,622

, then write the three numerals in an ascending order.

The greater numeral is _____, the smaller numeral is _____

The order is : _____

6. Write a numeral that is greater than 4,789,562,430 and a numeral that is less than

4,789,562,430 and write the three numerals in an ascending order.

The greater numeral is _____, the smaller numeral is _____

The order is : _____

7. Create a numeral that is greater than 8,164,201,404 and a numeral that is less than

8,164,201,404 then write the three numerals in a descending order.

The greater numeral is _____, the smaller numeral is _____

The order is : _____

8. Write a numeral that is greater than 6,562,942,735 and a numeral that is less than

6,562,942,735 and write the three numerals in descending order.

The greater numeral is _____, the smaller numeral is _____

The order is : _____

Choose the correct answer.

1. Which choice shows the numbers in an ascending order?

- | | | | |
|-----------------|-----------------|-----------------|------------------|
| A. 1. 3,456,871 | B. 1. 7,456,232 | C. 1. 5,786,321 | D. 1. 1,263,572 |
| 2. 3,578,462 | 2. 6,785,000 | 2. 5,795,786 | 2. 12,213,573 |
| 3. 987,541 | 3. 6,670,785 | 3. 5,895,432 | 3. 4,262,563 |
| 4. 5,743,261 | 4. 5,700,726 | 4. 6,721,000 | 4. 1,000,000,000 |
| 5. 8,784,561 | 5. 5,700,624 | 5. 7,000,000 | 5. 7,865,321,000 |

2. Which choice shows the numbers in a descending order?

- | | |
|--------------------------------|--------------------------------|
| A. 1. $600 + 80 + 6$ | B. 1. $800 + 60 + 2$ |
| 2. $800 + 60 + 2$ | 2. eight hundred sixty |
| 3. eight hundred sixty | 3. 826 |
| 4. six hundred twenty-eight | 4. $600 + 80 + 6$ |
| 5. 826 | 5. six hundred twenty-eight |
|
 |
 |
| C. 1. six hundred twenty-eight | D. 1. six hundred twenty-eight |
| 2. 826 | 2. $600 + 80 + 6$ |
| 3. $600 + 80 + 6$ | 3. 826 |
| 4. $800 + 60 + 2$ | 4. eight hundred sixty |
| 5. eight hundred sixty | 5. $800 + 60 + 2$ |

3. Which of the following digits makes the sentence is true? $785 > 7\ \underline{\quad} 5 > 755$

- A. 2 B. 4 C. 6 D. 8

4. The table below shows the average distances from the planets to the Sun.

Planet	Jupiter	Mars	Venus	Earth
Distance from the Sun in km	778,340,821	227,943,000	108,209,000	149,598,000

Which planet from above is nearest to the Sun?

- A. Jupiter B. Mars C. Venus D. Earth

1-10 Predicting the Unpredictable

1-11 Rounding Rules

Learn Predicting the unpredictable

Ahmed went to the stadium to watch a football match for his favorite team. The stadium capacity is 72,200 seats.

Ahmed used front-end estimation to expect the number of spectators in this match. He said the number of spectators was about 70,000.

- In this strategy, you just look at the first digit of the number from the left side, or the highest place value. Write the first digit as it is, and change the rest of digits into zeros.



Example

Use front-end strategy to estimate.

Number	Estimate
87,562	80,000
3,457,426	3,000,000
Five milliard, two hundred thousand, five hundred three	5,000,000,000
$9,000,000,000 + 700,000,000 + 8,000 + 700 + 40 + 5$	9,000,000,000
Seventy-four million, five hundred twenty-eight	70,000,000

Check your understanding

- Use front-end strategy to estimate.

Number	Estimate
7,845,626	
86,421,000	
Four milliard, sixty-four million, three hundred thousand, thirty-one	
$(6 \times 100,000,000) + (3 \times 10,000,000) + (5 \times 1,000,000)$ $+ (7 \times 1,000) + (2 \times 10)$	

Notes for parents :

- Tell your child that we use front-end estimation to approximate large numbers.

Learn Rounding rules

Youssef visited an amusement park on his vacation. He rode a roller coaster that is 2,181 meters long. About how long is the roller coaster?

Since you do not need an exact number, you can estimate by rounding the number.



Different Ways to round 2,181 to the nearest thousand

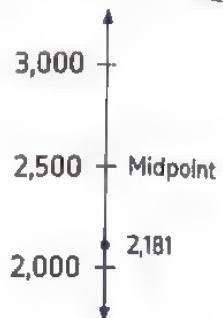
Way 1 You can use [midpoint strategy].

2,181 is closer to 2,000 than to 3,000

So, round 2,181 to 2,000

Written as $2,181 \approx 2,000$

and read as 2,181 approximately equals 2,000



Way 2 You can use [place value strategy]

Step 1

Find the place you want to round to. Underline the digit in that place.

2,181
↑
Thousands place

Step 2

Look at the digit to its right. Circle that digit.

2,181
↑
digit to the right

Step 3

- If the circled digit is 5 or greater, round up.
- If the circled digit is less than 5, round down.
- Change each digit to the right of the rounding place to 0
- 1 is less than 5, so

2,181 $\xrightarrow{\text{rounds to}}$ 2,000

Solution The roller coaster is about 2,000 meters long.

Notes for parents :

- Remind your child to round up if the digit to the right of the place value he/she wants to round to is equal to or greater than 5

Example 1

Use a number line to round each of the following.

a. 74,231 (to the nearest 1,000)

b. 9,360 (to the nearest 100)

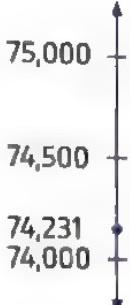
Solution 

a. 74,231 is between 74,000

and 75,000

then

$$74,231 \approx 74,000$$

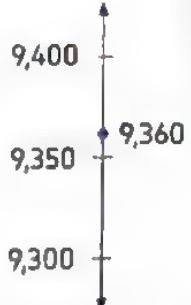


b. 9,360 is between 9,300

and 9,400

then

$$9,360 \approx 9,400$$

**Example 2**

Use place value strategy to round each of the following.

a. 2,618 (to the nearest 10)

c. 3,697,852,721 (to the nearest Ten Million)

e. 999,999 (to the nearest Ten Thousand)

b. 174,568 (to the nearest 10,000)

d. 7,556,462 (to the nearest Million)

f. 13,999,999 (to the nearest Hundred)

Solution 

a. 2,618 \rightarrow 2,620 [8 > 5]

b. 174,568 \rightarrow 170,000 [4 < 5]

c. 3,697,852,721 \rightarrow 3,700,000,000 [7 > 5]

d. 7,556,462 \rightarrow 8,000,000 [5 = 5]

e. 999,999 \rightarrow 1,000,000 [9 > 5]

f. 13,999,999 \rightarrow 14,000,000 [9 > 5]

ERROR ALERT
When you round a 9 to the next greater digit, remember to regroup to the next place value.

Check your understanding

Round the following.

a. 85,721 $\xrightarrow{\text{to the nearest 1,000}}$ _____

b. 3,562,291 $\xrightarrow{\text{to the nearest}} \text{Ten Thousand}$ _____

c. 3,895 $\xrightarrow{\text{to the nearest}} \text{Hundred}$ _____

d. 9,999,998 $\xrightarrow{\text{to the nearest}} \text{Million}$ _____

- If necessary, allow your child to write the standard form of the number before rounding

Exercise

6

REMEMBER

1-10 Predicting the Unpredictable

1-11 Rounding Rules

PROBLEM SOLVING

From the school bag

1. Use front-end strategy to estimate each of the following.

- a. 7,852,631 b. 78,512,900 c. 3,900,500,231
d. 8,062,431,562 e. 1,946,621,562 f. 4,622
g. □ Seventy-five million, six hundred twenty-two thousand, four hundred thirteen.
h. Twenty million, seven hundred fifty-one thousand, eighty.
i. Two milliard, four hundred one million, fourteen thousand.
j. Three hundred seventy-nine million, four hundred sixty-one thousand, two hundred eight.
k. $[7 \times 1,000,000] + [5 \times 100,000] + [4 \times 1,000] + [5 \times 100] + [4 \times 10] + [2 \times 1]$
l. $[5 \times 10,000,000] + [8 \times 100,000] + [9 \times 10,000] + [4 \times 100] + [6 \times 1]$
m. □ $800,000 + 7,000 + 400 + 60$
n. $3,000,000 + 500,000 + 9,000 + 700 + 10$
o. $9,000,000,000 + 20,000,000 + 4,000 + 30$

2. Round each number to the place value of the underlined digit.

- | | | |
|-------------------|----------------------|-------------------------|
| a. <u>7</u> 69 | b. <u>7</u> ,507 | c. <u>1</u> 8,682 |
| d. <u>5</u> 7,945 | e. <u>5</u> ,645,408 | f. 284, <u>7</u> 92,300 |
| g. <u>9</u> 21 | h. <u>9</u> 9,814 | |

3. Round to the nearest Ten.

- a. 423 — b. 549 — c. 495 — d. 1,287 —

4. Round to the nearest Hundred.

- a. 874 — b. 416 — c. 4,398 — d. 1,952 —

5. Round to the nearest Thousand.

- a. 8,090 — b. 9,900 — c. 15,123 — d. 68,500 —

6. Round to the nearest Ten Thousand.

- a. 37,205 — b. 58,936 — c. 324,520 — d. 845,625 —

7. Round to the nearest Hundred Thousand.

- a. 483,267 b. 678,090 c. 449,300 d. 12,786,500

8. Round to the nearest Million.

- a. 35,458,936 b. 20,843,267
c. 135,984,600 d. 7,352,894,351

9. Round each of the following by using the midpoint strategy, record the midpoint of the number line and the place of each number; then round to the nearest thousand.

a. 8,472



b. 17,856



c. 342,351



d. 2,561,432



10. Draw the number line, record the midpoint, then round each of the following numbers.

- a. ... 250,000 [to the nearest Hundred Thousand]

- b. ... 700,500 [to the nearest Hundred Thousand]

- c. 362,261 [to the nearest Ten Thousand]

- d. 36,951 [to the nearest Hundred]

11. Round each number to the nearest ten, thousand, hundred thousand, and million.

Numbers	Nearest ten	Nearest thousand	Nearest hundred thousand	Nearest million
a. 1,657,809				
b. 2,709,365				
c. 16,442,896				
d. 8,851,342				

12. Write 5 numbers if rounded to the nearest Thousand the result is 312,000.

•

13. Use the table to answer the questions.

•

- a. Which kind of magazine has a circulation of about 5,000,000 ?
- b. Round to the nearest million each number of the table.

Circulation of Magazines	
Kinds of Magazines	Number Circulated
News magazine	5,748,324
Sports magazine	4,928,165
Food magazine	1,875,692
Travel magazine	1,379,685

14. A number is between 23,750 and 23,760 What could the number be if it is rounded to 23,750?

•

15. A plane's altitude increased by 2,721 metres.

•

Round this number to the nearest Thousand.

16. A runner ran 1,537 metres, but he describes the distance he ran with a rounded number.

•

Round 1,537 to the nearest Hundred.

17. A record number of 23,386 ants lives in colony A.

•

Round this number to the nearest Ten Thousands.



Challenge

18. What is the greatest whole number that rounds to 300,000 ? What is the least ?

•

Multiple Choice Questions

Choose the correct answer.

1. Round 387,932 to the nearest hundred.

- A. 387,900
- B. 388,000
- C. 387,930
- D. 390,000

2. Mustafa rounded a number to the nearest ten million. His rounded number was 540,000,000. Which number could have been Mustafa's original number?

- A. 534,107,832
- B. 534,346,203
- C. 537,812,764
- D. 545,448,420

3. Sameh rounded a number and got 340.

Which number could have been his original number?

- A. 336
- B. 347
- C. 350
- D. 349

4. The number that shows 1,236,532,748 rounded to the ten millions place is

- A. 1,220,000,000
- B. 1,230,000,000
- C. 1,240,000,000
- D. 1,250,000,000

5. Which number could be rounded to 120,000 when rounded to the nearest ten thousand?

- A. 125,678
- B. 116,034
- C. 112,625
- D. 20,789

6. Which number could be rounded to 430,000 when rounded to the nearest Ten Thousand?

- A. 328,782
- B. 437,651
- C. 435,826
- D. 432,198

7. What is the largest number can be rounded to 2,500 when rounded to the nearest hundred?

- A. 2,450
- B. 2,551
- C. 2,549
- D. 2,499

8. By using front-end strategy the estimation of three hundred million, sixty four thousand, 1 is _____

- A. 3,000,000
- B. 30,000,000
- C. 300,000,000
- D. 34,000,000

9. By using front-end strategy $7,756,462 \approx$ _____

- A. 7,000,000
- B. 8,000,000
- C. 77,000,000
- D. 7,700,000

Concept 2 Assessment || Unit 1



1. Put (✓) to the correct answer and (✗) to the incorrect answer.

- a. $754,321 < 98,564$
- b. $3,456,421 \approx 3,500,000$ to the nearest hundred thousand.
- c. 7,856,226 is estimated to 8,000,000 by front-end strategy.
- d. Five milliard, two hundred thousand > Five milliard, ninety thousand.
- e. $17,856 \approx 20,000$ to the nearest thousand.
- f. $5,000,000,000 + 300,000 + 400 + 7 > 5,000,000,000 + 90,000 + 8,000 + 400 + 9$

2. Choose the correct answer.

- a. Which number rounded to 700,000 when rounded to the nearest hundred thousand
A. 784,452 B. 653,429 C. 760,304 D. 632,561
- b. Which number is greatest ?
A. 549,300 B. 4,004,030 C. 5,490,003 D. 594,030
- c. Which shows the numbers in order from least to greatest ?
A. 102,397 , 102,395 , 102,359 B. 216,001 , 216,101 , 216,010
C. 422,956 , 422,596 , 422,298 D. 575,029 , 575,209 , 575,290
- d. Which digit makes the number sentence is true ?
 $7,625,431 > 7,6__5,431$
A. 1 B. 2 C. 3 D. 4
- e. What is 7,542,613 rounded to the nearest ten thousand ?
A. 7,543,000 B. 7,540,000 C. 7,500,000 D. 8,000,000
- f. Which comparison is correct ?
A. $84,760 < 84,670$ B. $84,670 = 84,760$
C. $84,760 > 84,670$ D. $84,670 > 84,760$

3. Complete.

- a. 7,866,214,261 rounded to the nearest ten million \approx _____
- b. The numeral that is smaller in the milliard place than 8,579,462,121 is _____
- c. Three milliard, six hundred million, thirty eight is estimated to _____ by front-end strategy.
- d. A numeral in expanded form that equals 3,456,231,625 is _____

- e. $875,621 < [\quad \times 100,000] + [7 \times 10,000] + [4 \times 1,000] + [6 \times 100]$
f. The place value would you be rounding if you rounded the number 117,290 to 120,000
is —

4. Compare. Write ($>$, $<$ or $=$).

- a. 1,000,000,000 999,999,999
- b. $3,000,000,000 + 50,000,000 + 700,000 + 500 + 7$ Three milliard, five hundred million, thirty.
- c. 8,000 million 8 milliard.
- d. Fifteen million, three hundred twenty-five thousand, thirteen $(1 \times 10,000,000) + [5 \times 1,000,000] + [2 \times 1,000] + [5 \times 100] + [3 \times 10]$

5. Sara rounded a number to the nearest Ten and got 460. What could her original number have been?

6. Find all of the digits that can replace

$$7 \quad 3,562 > 753,562$$

7. Write each of the following numerals in standard form and arrange the numerals in a descending order.

- Four hundred thirty-four thousand, eight hundred thirty-one
- 434,381
- $[4 \times 100,000] + [3 \times 10,000] + [4 \times 100] + [9 \times 10] + [3 \times 1]$
- $400,000 + 40,000 + 3,000 + 800 + 30 + 5$

Standard form	Descending order

8. Write a numeral that is less in the Hundred Millions place than 632,714,000

9. Write five numbers that round to 785,000

10. What is the largest number that can be rounded to 3,700 when rounded to the nearest hundred?

11. Write a numeral that is greater than 3,456,462,570 and a numeral that is less than 3,456,462,570 and write the three numeral in an ascending order.

12. Use front-end estimation for the following numbers

- a. 6,627,513,202
- b. one hundred sixty-three million, four hundred fifty thousand, nine hundred four.

Unit One Assessment



1. Choose the correct answer.

- a. The largest 5-digit number is _____
A. 10,000 B. 100,000 C. 99,999 D. 98,765
- b. How many digits does the numeral 314,562,430 have ?
A. 5 B. 6 C. 8 D. 9
- c. What is the standard form for three milliard, seven hundred thirty-five thousand, fifty?
A. 3,735,000,050 B. 3,735,500
C. 3,000,735,050 D. 3,735,050
- d. Which is the compose to $[8 \times 100,000] + [4 \times 1,000] + [7 \times 100] + [1 \times 10]$?
A. 804,710 B. 840,710 C. 804,170 D. 840,701
- e. 3,752,000 _____ three milliard,twenty
A.> B.< C.=
- f. Which number round to 5,000,000 when rounded to the nearest million ?
A. 4,754,216 B. 4,261,562
C. 5,642,721 D. 5,810,000

2. Complete the following.

- a. The value of the digit 4 in the number 3,452,631,901 is _____
- b. 1,732,053,000 in word form is _____
- c. _____ is 100 times greater than four hundred thousand.
- d. $735,462 \approx$ _____ [Rounded to the nearest ten thousand]
- e. 3,504,800,501 in expanded form
is _____
- f. $5,856,469 \approx 5,900,000$ [Rounded to the nearest _____]

3. Put (✓) to the correct answer and (✗) to the incorrect answer.

- a. $(5 \text{ thousands and } 9 \text{ hundreds}) \times 10 = 59,000$ ()
- b. $30,000 + 7,000 + 30 + 4 = 3734$ ()
- c. The compose of number $(8 \times 100,000) + (5 \times 1,000) + (5 \times 100) + (4 \times 10)$
is 85,540 ()
- d. $500,000 + 20,000 + 30 + 4 > 90,000 + 8,000 + 60 + 9$ ()
- e. 1,854,623 estimate to 1,000,000 by front-end strategy. ()
- f. The smallest 5-different digits number is 12345 ()

4. Match the cards that have the same number.

a.
$$\begin{array}{l} [7 \times 10,000] + [4 \times 100] \\ + [8 \times 10] + [9 \times 1] \end{array}$$

b. 7,400,000,890

c. $7,000,000 + 400,000 + 80 + 9$

d. 7 milliard, 40 thousand, 890

1. seven milliard, four hundred million, eight hundred ninety

2. seven million, four hundred thousand, eighty-nine

3. 7,000,040,890

4. seventy thousand, four hundred eighty-nine

5. In the number 59,492 how many times greater is the digit in the Thousands place than
the digit in the Tens place ?

6. Use the digits 7,4,2,0,3,5,6,8 to make the greatest number you can.

Then use the same digits to make the smallest number you can and round each number
to the nearest Million.

7. Write a number that could be rounded to 780,000 when rounded to the nearest
Ten Thousand.

8. Arrange in an ascending order, using the forms in which the numbers are written.

- $[7 \times 1,000,000] + [5 \times 100,000] + [4 \times 1,000] + [2 \times 100] + [3 \times 10]$
- Seven million, five hundred forty thousand, two hundred three.
- $7,000,000 + 500,000 + 40,000 + 2,000 + 3$
- 75,423
- Seven million, fifty thousand, thirty.

9. Write the place value of the digit 5 in each of the following numbers.

- a. 157,321,462
- b. 5,463,002,127

10. Complete the following.

composed : 2,734,561,421

Decomposed : _____

Milliards	Millions			Thousands			Ones		
0	H	T	O	H	T	O	H	T	O

11. Round 664,418

- a. to the nearest ten _____
- b. to the nearest ten thousand _____

12. Write a numeral that is less in the Hundred Thousands place

than 3,785,462,594

UNIT
2

Theme 1 | Number Sense and Operations

Addition and Subtraction Strategies

» Concept 1 : Using addition and subtraction strategies

» Concept 2 : Solving multistep problems

Fast Fact

Honeybees are the only insects that make food for people. They collect pollen and nectar from flowers to make honey.



Concept

1

Using Addition and Subtraction Strategies

Fast Fact

There are over 12,000 ant species worldwide.

There are about 20,000 different species of bees in the world.

What is the difference between them ?!





Concept Overview

In concept 1:

Using Addition and Subtraction Strategies, students review and explore addition and subtraction strategies, including mental math strategies and the standard addition and subtraction algorithms. This work helps prepare students for working with larger numbers and provides context for the importance of estimating to check the reasonableness of answers. Although instruction in addition and subtraction strategies does not explicitly continue after unit 2, students should continue to practice throughout the year in a variety of contexts, including bare number problems, story problems, math projects, and assessments.

Lesson No	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 1	2-1 Properties of Addition	Additive identity property - Associative property - Commutative property	<ul style="list-style-type: none">Students will identify the properties of addition and subtraction.Students will explain the properties of addition and subtraction.Students will investigate to determine whether addition properties apply to subtraction.
Lesson 2	2-2 Review Mental Math Strategies	Benchmark - Estimate - Mental Math - Round - Subtrahend - Minuend.	<ul style="list-style-type: none">Students will apply a variety of strategies to add and subtract mentally.Students will explain the importance of mental math skills.
Lesson 3	2-3 Addition with Regrouping	Algorithm	<ul style="list-style-type: none">Students will add multi-digit whole numbers.Students will estimate to determine if their answer is reasonable.
Lesson 4	2-4 Subtraction Strategies	Difference - Subtrahend - Minuend	<ul style="list-style-type: none">Students will use decomposition of numbers to subtract multidigit whole numbers.Students will explain the importance of finding patterns and relationships in mathematics.
	2-5 Subtraction with Regrouping	Algorithm - Regroup	<ul style="list-style-type: none">Students will use place value to help subtract using the standard algorithm.Students will subtract with regrouping.Students will estimate to check the reasonableness of their answers.

2-1 Properties of Addition

Learn! What is the addition properties ?

Addition properties are rules for addition that are always true.

- Commutative property.
- Identity property.
- Associative property.

Commutative Property of Addition

Maged saw 9 birds on Monday and 5 birds on Tuesday.

How many birds did he see in all ?



You can add numbers in any order and get the same sum.

 9 \uparrow addend	$+$ \uparrow addend	$=$ 14 \uparrow sum	5 \uparrow addend	$+$ \uparrow addend	$=$ 14 \uparrow sum
---------------------------------	---------------------------------	----------------------------------	-----------------------------	---------------------------------	----------------------------------

So, $9 + 5 = 5 + 9$. Maged saw 14 birds.

Identity Property of Addition

Maged saw 8 fish. Shady did not see any. How many fish did the boys see in all?

If you add zero to any number, the sum is that number.

$$8 + 0 = 8$$

$$0 + 8 = 8$$

So, the boys saw 8 fish in all.

Associative Property of Addition

Maged collected 7 brown shells, 4 white shells, and 6 gray shells.

How many shells did he collect in all ?

You can group addends in different ways, and the sum will be the same.

$(7 + 4)$ $=$ 11	$+$ 6 $=$ 17	7 $=$ 7	$+$ $[4 + 6]$ $=$ 10	$+$ 10 $=$ 17
--------------------------	---------------------------	-------------------	---------------------------------	----------------------------

So, $(7 + 4) + 6 = 7 + (4 + 6)$.

Maged collected 17 shells in all.

MATH IDEA
Parentheses () show which numbers to add first.

Notes for parents :

- Let your child give you more examples for each property and ask him/her to explain what each property states.

Example 1

Find the missing number, and name the property you used:

a. $12 + 64 = \quad + 12$

b. $14 = 0 +$

c. $[1 + 19] + 11 = 1 + [19 + \quad]$

d. $90 + \quad = 90$

Solution 

a. 64 [commutative property]

b. 14 [additive identity property]

c. 11 [associative property]

d. 0 [additive identity property]

Example 2

Solve each problem, and name the property you used:

a. $12 + 28 + 30$

b. $16 + 9 + 4$

c. $12 + 28 + 15 + 35$

Solution 

a. $12 + 28 + 30$ Use the associative

$= [12 + 28] + 30$ property to group



$= 40 + 30$ numbers that are

$= 70$ easy to add mentally.

b. $16 + 9 + 4$

$= 16 + 4 + 9$ [commutative property]

$= [16 + 4] + 9$ [associative property]

$= 20 + 9 = 29$

c. $12 + 28 + 15 + 35$

$= [12 + 28] + [15 + 35]$ [associative property]

$= 40 + 50 = 90$



Check your understanding

Solve the problems, then name the property or properties illustrated by each problem

[commutative, associative or additive identity]

a. $[8 + 2] + 6 =$ _____

Property: _____

b. $7,635 + 0 =$ _____

Property: _____

c. $39 + [20 + 40] =$ _____

Property: _____

d. $17 + 23 + 3 =$ _____

Property: _____

e. $136 + 37 + 13 + 14 =$ _____

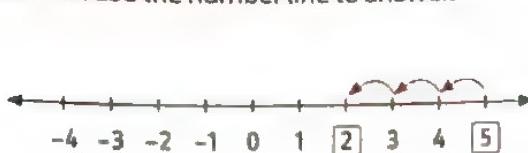
Property: _____

* Let your child know that he/she could use more than one property to solve a problem.

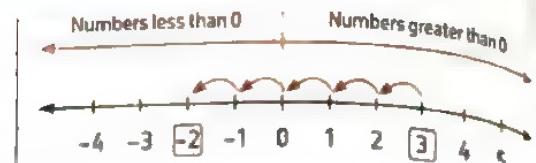
Do the addition properties apply to subtraction?

- Is $5 - 3$ the same as $3 - 5$?

You can use the number line to answer.



$$5 - 3 = 2$$



$$3 - 5 = -2 \text{ [number less than 0]}$$

The differences are NOT the same

You can not subtract numbers in any order and get the same difference.

So, commutative property of addition *does not apply* to subtraction.

- Subtraction has no identity.

There is no number you can subtract from any number, or subtract any number from it, the difference is that number.

- Is $(5 - 3) - 2$ the same as $5 - (3 - 2)$?

$$(5 - 3) - 2 = 2 - 2$$

$$= 0$$

$$5 - (3 - 2) = 5 - 1$$

$$= 4$$

The differences are NOT the same

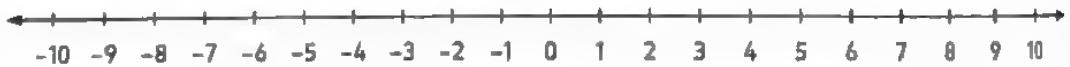
You can not group in different ways, and the difference will be the same.

So, associative property of addition *does not apply* to subtraction.



your understanding

Choose one property of addition and explain why does not apply to subtraction and give an example. Use the number line to help subtract.



Notes for parents :

- Ask your child to create a subtraction problem to investigate if the addition properties apply to subtraction.
- Let your child explain using words.

Exercise

7

2-1 Properties of Addition

REMEMBER

UNDERSTAND

PROBLEM SOLVING

From the school book

1. Complete each number sentence. Name the property you used.

a. $24 + 99 = \underline{\hspace{2cm}} + 24$

b. $152 + 0 = \underline{\hspace{2cm}}$

c. $[6 + 4] + 36 = 6 + [4 + \underline{\hspace{2cm}}]$

d. $3 + [3 + \underline{\hspace{2cm}}] = [3 + 3] + 1$

e. $68 + \underline{\hspace{2cm}} = 76 + 68$

f. $\underline{\hspace{2cm}} + 90 = 90$

g. $[4 + 9] + 2 = \underline{\hspace{2cm}} + 2$

h. $14 + 8 = 8 + \underline{\hspace{2cm}}$

2. Choose the correct property.

a. $[12 + 8] + 7 = 12 + [8 + 7]$

[Additive identity - Commutative - Associative]

b. $9 + 21 = 21 + 9$

[Additive Identity - Commutative - Associative]

c. $[45 + 5] + 10 = 45 + [5 + 10]$

[Additive identity - Commutative - Associative]

d. $0 + 5,274 = 5,274$

[Additive Identity - Commutative - Associative]

e. $26 + 10 + 34 = 26 + 34 + 10$

[Additive identity - Commutative - Associative]

3. Complete to find the sum.

a. $15 + 5 = 5 + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

[property]

b. $2,514 + 0 = \underline{\hspace{2cm}}$

[property]

c. $92 + 321 + 8 = 92 + 8 + 321$

[property]

$= [\underline{\hspace{2cm}} + \underline{\hspace{2cm}}] + 321$

[property]

$= \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

d. $1 + 16 + 4$

$= 1 + [16 + \underline{\hspace{2cm}}]$

[property]

$= 1 + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

7. Solve the problems and circle the property (or properties) you used to solve the problems.
 ↗ Then, write your own problem showing the same property and using the same numbers.

	Circle one	Problem	Solve	Write your own
a.	Associative Commutative Additive identity	$7 + 3 + 5$		
b.	Associative Commutative Additive identity	<input checked="" type="checkbox"/> $15 + 20 + 13$		
c.	Associative Commutative Additive identity	<input checked="" type="checkbox"/> $40 + 21 + 36$		
d.	Associative Commutative Additive identity	<input checked="" type="checkbox"/> $0 + 4,502$		
e.	Associative Commutative Additive identity	<input checked="" type="checkbox"/> $200 + 0 + 43$		
f.	Associative Commutative Additive identity	$421 + 9 + 29$		

Challenge

8. Sara needs to find the sum of 24 , 35 , 105 and 66.
 ↗ How can she group the addends to make it easier to add ?
 Write the property used in each step.
9. Is $(540 - 320) + 20$ equal to $540 - [320 + 20]$?
 ↗ Explain why or why not.

Multiple Choice Questions

Choose the correct answer.

1. Gamal wrote $(13 + 7) + 41 = 13 + (7 + 41)$ using the property of addition.
- A. additive identity
 - B. commutative
 - C. associative

3. Which of these statements used commutative property of addition to find $12 + 55 + 38$?
- A. $[12 + 55] + 38$
 - B. $12 + [55 + 38]$
 - C. $12 + 38 + 55$
 - D. $12 + 55 + 38$

5. A student wrote the statement $65 - 42 = 42 - 65$
- Why is this statement incorrect?
- A. The associative property applies to addition but not subtraction.
 - B. The commutative property applies to addition but not subtraction.
 - C. The associative property applies to subtraction but not addition.
 - D. The commutative property applies to subtraction but not addition.

6. Emad writes $17 - (9 + 1) = [17 - 9] + 1$ Is the statement true?
- A. Yes, because the associative property applies to subtraction.
 - B. Yes, because the commutative property applies to subtraction.
 - C. No, because the associative property does not apply to subtraction.
 - D. No, because the commutative property does not apply to subtraction.

7. The additive identity property of addition states that
- A. when you add zero to any number, the sum is zero.
 - B. when you add zero to any number, the sum is that number.
 - C. when you add zero to any number, the sum is more than that number.
 - D. when you add zero to any number, the sum is less than that number.

2. A student wrote the statement using the commutative property of addition.
- A. $45 + 12 = 45 + 0$
 - B. $45 + 12 = 12 + 45$
 - C. $45 + 12 = 57$
 - D. $45 + 12 = 12 + 57$

4. Esslam wrote the statement $(10 + 5) + 20 = [10 + 20] + 5$
- Which properties of addition did he use?
[Select two correct answers]
- A. Additive identity
 - B. Commutative
 - C. Associative

2-2 Review Mental Math Strategies

Learn

Amal picked 88 red apples.
Basma picked 39 green apples.

- How many apples did Amal and Basma pick in all?
- How many apples did Amal pick more than Basma?



Mental math strategies can help you add and subtract.

Compensation Strategy

Compensation can be used to Make a Benchmark to find the sum of two numbers, and the difference between them mentally.

1. To find $39 + 88$

Add an amount to one number and subtract the same amount from the sum.

$$\begin{array}{r} 39 + 88 \\ \downarrow \\ 39 + 1 \qquad \text{Add 1 to 39.} \\ \downarrow \\ 40 + 88 = 128 \end{array}$$

$128 - 1 = 127$ Subtract 1 from the answer to compensate.

Amal and Basma picked 127 apples.

2. To find $88 - 39$

Add an amount to subtrahend and add the same amount to the difference.

$$\begin{array}{r} 88 - 39 \\ \downarrow \\ 39 + 1 \qquad \text{Add 1 to 39.} \\ \downarrow \\ 88 - 40 = 48 \end{array}$$

$48 + 1 = 49$ Since you subtracted 1 more than you should have, you must add 1 to 48 to compensate.

Amal picked 49 apples more than Basma.

- Let your child recognize the importance of being able to add or subtract using mental math

Example 1Find each result using mental math: a. $255 + 416$ b. $145 - 17$ **Solution**

a.
$$\begin{array}{r} 255 \\ + 416 \\ \hline \end{array}$$

Add 4 to 416
to make 420

$$\begin{array}{r} 255 \\ + 420 \\ \hline 675 \\ - 4 \\ \hline 671 \end{array}$$

subtract 4 to
compensate for
adding 4 extra

So, $255 + 416 = 671$

In a short way:

$$255 + 416 = [255 + 420] - 4 = 675 - 4 = 671$$

b.
$$\begin{array}{r} 145 \\ - 17 \\ \hline \end{array}$$

Add 3 to 17
to make 20Add 3 to
compensate for
subtracting
3 extra

$$\begin{array}{r} 145 \\ - 20 \\ \hline 125 \\ + 3 \\ \hline 128 \end{array}$$

So, $145 - 17 = 128$

In a short way:

$$145 - 17 = [145 - 20] + 3 = 125 + 3 = 128$$

Break Up and Bridge Strategy

This strategy depends on breaking up numbers into numbers that are easier to add or subtract mentally.

Example 2Find each result using mental math: a. $58 + 26$ b. $78 - 35$ **Solution**

- a. • Break up both numbers into tens and ones.

$$58 = 50 + 8$$

$$26 = 20 + 6$$

$$\bullet \text{Add the tens: } 50 + 20 = 70$$

$$\bullet \text{Add the ones: } 8 + 6 = 14$$

$$\bullet \text{Add the sums: } 70 + 14 = 84$$

So, $58 + 26 = 84$

Why It works

$$58 + 26$$

$$[50 + 8] + [20 + 6]$$

$$[50 + 20] + [8 + 6]$$

$$70 + 14$$

$$= 84$$

Commutative
and Associative
Properties of
Addition**Another Way**

- Break up only the 26.

$$26 = 20 + 6$$

$$\bullet \text{Add 20 to 58: } 58 + 20 = 78$$

$$\bullet \text{Add 6 to 78: } 78 + 6 = 84$$

So, $58 + 26 = 84$

**Notes for parents :**

Ask your child to find the sum of 39 + 24 mentally and let him/her explain the steps in words.

- b. • Break up both numbers into tens and ones.

$$78 = 70 + 8$$

$$35 = 30 + 5$$

• Subtract the tens: $70 - 30 = 40$

• Subtract the ones: $8 - 5 = 3$

• Add the differences: $40 + 3 = 43$

$$\text{So, } 78 - 35 = 43$$

Another Way

- Break up only the 35

$$35 = 30 + 5$$

• Subtract 30 from 78: $78 - 30 = 48$

• Subtract 5 from 48: $48 - 5 = 43$

$$\text{So, } 78 - 35 = 43$$

Add to Subtract Strategy

Add to subtract strategy states that count up from the subtrahend to the minuend.

Example 3

Find: a. $93 - 78$

b. $254 - 195$

Solution

a. $78 + 2 = 80$

\swarrow
 $80 + 10 = 90$

\swarrow
 $90 + 3 = 93$

So, $2 + 10 + 3 = 15$

Then: $93 - 78 = 15$

b. $195 + 5 = 200$

\swarrow
 $200 + 50 = 250$

\swarrow
 $250 + 4 = 254$

So, $5 + 50 + 4 = 59$

Then: $254 - 195 = 59$

Front-End Estimation strategy

Front-End Estimation states that add or subtract only the largest place values in each number to produce an estimate (that may not be close to the actual answer).

Example 4

Estimate to find the results: a. $573 + 228$

b. $176 - 82$

Solution

a. $573 \rightarrow 500$

$+ 228 \rightarrow + 200$

$\underline{700}$

b. $176 \rightarrow 100$

$- 82 \rightarrow - 80$

$\underline{20}$

* Let your child find $(276 - 155)$ mentally using at least two strategies and explain the steps.

Rounding Strategy

Rounding strategy states that select one place value for each number. Determine which multiple of 10, 100 or 1,000 (and so on) it is closest to, and then add or subtract for a more accurate estimate.

Example 5

Round to find the results : a. $1,020 + 861$

b. $267 - 83$

Solution

$$\begin{array}{r} \text{a.} \\ \begin{array}{r} 1,020 \\ + 861 \end{array} \\ \hline \end{array} \quad \begin{array}{l} \text{Round to 100} \\ \rightarrow \\ 1,000 \\ + 900 \\ \hline 1,900 \end{array}$$

$$\begin{array}{r} \text{b.} \\ \begin{array}{r} 267 \\ - 83 \end{array} \\ \hline \end{array} \quad \begin{array}{l} \text{Round to 10} \\ \rightarrow \\ 270 \\ \text{Round to 10} \\ \rightarrow \\ 80 \\ \hline 190 \end{array}$$

Note that :

Rounding strategy is a more accurate estimation to the actual results more than front-end estimation strategy.



your understanding

- Circle which mental math strategy would work best for each problem. Select two problems and solve them.

56 – 48	Compensation	Add to subtract
189 + 32	Add to subtract	Compensation
514 – 497	Add to subtract	Break up and Bridge
92 – 59	Compensation	Front-end estimation
314 + 83	Break up and bridge	Add to subtract
983 + 19	Compensation	Break up and Bridge

- Select one of the mental math strategies. Write an addition problem showing how you use that strategy.

Notes for parents :

- Let your child know that front-end estimation and rounding strategy do not give the exact answer.

Exercise

8

REMEMBER

PROBLEM SOLVING

From the school book

1. Solve the problems using the compensate to make a benchmark strategy. Show your work.

a. $38 + 85$

b. $\square 43 + 9$

c. $54 - 17$

d. $\square 92 - 39$

e. $333 + 149$

f. $\square 953 - 499$

2. Solve the problems using the Break Up and Bridge strategy. Show your work.

a. $713 + 125$

b. $42 + 27$

c. $\square 75 + 27$

d. $44 - 23$

e. $423 + 213$

f. $33 - 12$

3. Estimate to find the results. Use Front-End estimation strategy.

a. $83 - 17$

b. $123 + 79$

c. $1,142 - 534$

d. $709 - 221$

e. $431 + 376$

f. $75 - 12$

4. Estimate to find the results. Use rounding strategy.

a. $168 - 59$

b. $5,003 - 1,999$

c. $983 + 141$

d. $558 + 321$

e. $7,859 - 2,103$

f. $3,114 + 510$

5. Add or subtract mentally. Use Add to Subtract strategy. Show your steps.

a. $284 - 192$

b. $101 - 98$

c. $54 - 47$

d. $76 - 68$

e. $631 - 589$

f. $142 - 95$

6. Add or subtract mentally. Tell the strategy you used.

strategies
may vary

a. $27 + 31$

b. $68 - 24$

c. $116 - 97$

d. $78 - 15$

e. $212 + 107$

f. $352 - 175$

g. $576 - 391$

h. $\square 993 + 19$

i. $674 + 332$

7. On Friday, there were 2,999 people at the museum

• on Saturday, there were 1,465 people.

Use mental math to find how many people were at the museum during the two days.

Explain your strategy.



8. Andy's dog weighs 45 kilograms. Sally's dog

• weighs 27 kilograms.

How much more does Andy's dog weigh than Sally's dog? Explain your strategy.



9. Writing about Math

• Is Wael's explanation of the steps he used for mental math correct? If not, give the correct answer and explanation.

Find $565 + 302$.

$$565 + 5 = 570 \quad \text{I added 5 to 565}$$

$$570 + 302 = 872$$

$$872 + 5 = 877 \quad \text{Then I added 5 to the answer.}$$

Think it through
I should always check
to see if my answer is
reasonable.



Challenge

10. Add or subtract mentally without writing the results.

• Compare. Write ($>$, $<$ or $=$).

a. $77 + 13$ $125 - 34$

b. $47 + 26$ $46 + 28$

c. $512 - 489$ $75 - 52$

d. $224 + 176$ $468 - 67$

Multiple Choice Questions

Choose the correct answer.

1. Which answer using front-end estimation strategy to estimate $69 + 17$?

- A. $60 + 20 = 80$ B. $70 + 10 = 80$
C. $60 + 10 = 70$ D. $70 + 20 = 90$

2. Which answer using rounding strategy to estimate $374 - 112$?

- A. $300 - 100 = 200$ B. $300 - 200 = 100$
C. $400 - 100 = 300$ D. $400 - 200 = 200$

3. Which answer using break up and bridge strategy to find $87 - 19$?

- A. $87 - 10 = 77$, $77 - 9 = 68$
B. $87 - 20 = 67$, $67 + 1 = 68$
C. $90 - 20 = 70$
D. $90 - 19 = 71$, $71 - 3 = 68$

4. How can $160 - 69$ be found using compensation strategy?

- A. Subtract $160 - 60$, then add 9
B. Subtract $160 - 70$, then add 1
C. Subtract $160 - 60$, then subtract 9
D. Subtract $160 - 70$, subtract 1

5. Which of the following sentences using compensation strategy?

- A. $73 + 19 = (73 + 20) - 1 = 93 - 1 = 92$
B. $73 + 19 = 73 + [10 + 9] = [73 + 10] + 9 = 83 + 9 = 92$
C. $73 + 19 = 70 + 10 = 80$
D. $73 + 19 = [70 + 10] + [3 + 9] = 80 + 12 = 92$

6. Which of these strategies would be best to help you find the answer of $25 + 78$ using mental math? Select TWO correct answers.

- A. Round to 30 and 80, then add.
B. Round to 30 and 80, then subtract.
C. Use compensation by adding 25 and 75, then adding 3
D. Use compensation by adding 25 and 75, then subtracting 3
E. Use break up and bridge by breaking up 25 into 2 and 5 and breaking up 78 into 7 and 8.
Add $2 + 7$ and $5 + 8$, then add $9 + 13$.
F. Use break up and bridge by breaking up 25 into 20 and 5 and breaking up 78 into 70 and 8.
Add $20 + 70$ and $5 + 8$, then add $90 + 13$.

2-3 Addition with Regrouping

Learn

Mr. Faried has a large collection of kids toys. He has 129 toys. He plans to buy 97 more toys. How many toys will he have altogether?



$$\text{Add. } 129 + 97$$

$$\text{Estimate. } 100 + 100 = 200$$

(Numbers are rounded to the nearest 100.)

Step 1 Add ones.	Step 2 Add tens.	Step 3 Add hundreds.
$9 + 7 = 16$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $\begin{array}{r} 129 \\ + 97 \\ \hline 6 \end{array}$ <p>Regroup 16 ones as 1 ten 6 ones</p> </div>	$1 + 2 + 9 = 12$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $\begin{array}{r} 129 \\ + 97 \\ \hline 26 \end{array}$ <p>Regroup 12 tens as 1 hundred 2 tens</p> </div>	$1 + 1 = 2$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $\begin{array}{r} 129 \\ + 97 \\ \hline 226 \end{array}$ </div>

Mr. Faried will have 226 toys, and the answer is close to the estimate. So, 226 is reasonable.

Example 1

Round the addends to the nearest given estimation. Find the sum.

a. $34 + 88$

(Round to the nearest 10)

b. $658 + 135$

(Round to the nearest 100)

c. $5,195 + 3,761$

(Round to the nearest 1000)

Solution

a.

$$\begin{array}{r} \text{Round to} \\ 34 \xrightarrow{10} 30 \\ + 88 \xrightarrow{10} + 90 \\ \hline 122 \quad 120 \end{array}$$

The answer is reasonable.

b.

$$\begin{array}{r} \text{Round to} \\ 658 \xrightarrow{100} 700 \\ + 135 \xrightarrow{100} + 100 \\ \hline 793 \quad 800 \end{array}$$

The answer is reasonable.

c.

$$\begin{array}{r} \text{Round to} \\ 5,195 \xrightarrow{1,000} 5,000 \\ + 3,761 \xrightarrow{1,000} + 4,000 \\ \hline 8,956 \quad 9,000 \end{array}$$

The answer is reasonable.

Notes for parents :

- Ask your child to find the sum of 3,659 and 1,783, then use rounding to estimate and check if the answer is reasonable or not.

Example 2

Estimate using rounding to the nearest Ten Thousands, Thousand, Hundreds and Tens to check the reasonableness of the answer. Find the exact answer.

$$12,548 + 48,681$$

Solution

Round to nearest 10,000,

$$\begin{array}{r} 10,000 \\ + 50,000 \\ \hline 60,000 \end{array}$$

Round to nearest 1,000,

$$\begin{array}{r} 13,000 \\ + 49,000 \\ \hline 62,000 \end{array}$$

Round to nearest 100 ,

$$\begin{array}{r} 12,500 \\ + 48,700 \\ \hline 61,200 \end{array}$$

Round to nearest 10 ,

$$\begin{array}{r} 12,550 \\ + 48,680 \\ \hline 61,230 \end{array}$$

Exact answer

$$\begin{array}{r} 12,548 \\ + 48,681 \\ \hline 61,229 \end{array}$$

Notes

The exact answer is more reasonable to estimation using rounding to the nearest Ten than rounding to the nearest other place values.

**Check your understanding**

Find the exact sum. Estimate using rounding to check the reasonableness of the answer.

a. $319 + 63$ Round to 100 → _____

Round to other available place value to check _____

$$\begin{array}{r} 319 \\ + 63 \\ \hline \end{array}$$

b. $2,723 + 3,286$ Round to 1,000 → _____

$$\begin{array}{r} 2,723 \\ + 3,286 \\ \hline \end{array}$$

c. $42,401 + 17,923$ Round to 10,000 → _____

$$\begin{array}{r} 42,401 \\ + 17,923 \\ \hline \end{array}$$

* Let your child creates an addition problem and let him/her solve it to find the exact answer, then use rounding to check the reasonableness of the answer

Exercise

9

REMEMBER

UNDERSTAND

CHART

PROBLEM SOLVING

From the school book

2-3 Addition with Regrouping

- 1.** Estimate using rounding to the nearest Ten. Find the exact answer.

a.

$$\begin{array}{r} 19 \\ + 32 \\ \hline \end{array}$$

b.

$$\begin{array}{r} 351 \\ + 286 \\ \hline \end{array}$$

c.

$$\begin{array}{r} 1,578 \\ + 4,121 \\ \hline \end{array}$$

d.

$$\begin{array}{r} 73,427 \\ + 12,848 \\ \hline \end{array}$$

- 2.** Estimate using rounding to the nearest Hundred. Find the exact answer.

a.

$$\begin{array}{r} 726 \\ + 89 \\ \hline \end{array}$$

b.

$$\begin{array}{r} 134 \\ + 588 \\ \hline \end{array}$$

c.

$$\begin{array}{r} 6,836 \\ + 1,982 \\ \hline \end{array}$$

d.

$$\begin{array}{r} 34,762 \\ + 21,384 \\ \hline \end{array}$$

- 3.** Estimate using rounding to the nearest Thousand. Find the exact answer.

a.

$$\begin{array}{r} 3,355 \\ + 809 \\ \hline \end{array}$$

b.

$$\begin{array}{r} 26,721 \\ + 45,398 \\ \hline \end{array}$$

c.

$$\begin{array}{r} 85,632 \\ + 1,168 \\ \hline \end{array}$$

d.

$$\begin{array}{r} 25,441 \\ + 56,887 \\ + 13,456 \\ \hline \end{array}$$

- 4.** Round to estimate the sums. Then, solve the problems to find the exact answer. Show your work.

a.

$$\begin{array}{r} 28 \\ + 54 \\ \hline \end{array}$$

b.

$$\begin{array}{r} 593 \\ + 194 \\ \hline \end{array}$$

c.

$$\begin{array}{r} 579 \\ + 62 \\ \hline \end{array}$$

d.

$$\begin{array}{r} 3,520 \\ + 2,401 \\ \hline \end{array}$$

e.

$$\begin{array}{r} 3,975 \\ + 8,062 \\ \hline \end{array}$$

f.

$$\begin{array}{r} 2,227 \\ + 181 \\ \hline \end{array}$$

g.

$$\begin{array}{r} 8,049 \\ + 6,199 \\ \hline \end{array}$$

h.

$$\begin{array}{r} 6,732 \\ + 2,351 \\ \hline \end{array}$$

i.

$$\begin{array}{r} 2,549 \\ + 49,879 \\ \hline \end{array}$$

j.

$$\begin{array}{r} 34,013 \\ + 9,340 \\ \hline \end{array}$$

k.

$$\begin{array}{r} 63,456 \\ + 26,544 \\ \hline \end{array}$$

l.

$$\begin{array}{r} 368,547 \\ + 491,428 \\ \hline \end{array}$$

5. Find the exact sum. Estimate using rounding as the examples.

► Examples: • $5,432 + 1,296 = 6,728$



$$5,400 + 1,300 = 6,700$$

• $17,686 + 5,342 = 23,028$



$$17,690 + 5,340 = 23,030$$

a. $17 + 69 =$
+ =

b. $523 + 387 =$
+ =

c. $973 + 281 =$
+ =

d. $1,492 + 48 =$
+ =

e. $3,728 + 544 =$
+ =

f. $4,584 + 2,428 =$
+ =

g. $86,532 + 6,559 =$
+ =

h. $69,210 + 26,428 =$
+ =

i. $25,749 + 175,684 =$
+ =

j. $259,111 + 9,999 =$
+ =

k. $123,965 + 986,035 =$
+ =

l. $58,712 + 81,475 + 42,358 =$
+ + =

6. Find the sum. Compare using ($>$, $<$ or $=$).

a. $65 + 17$ $38 + 43$

b. $290 + 530$ $732 + 88$

c. $3,984 + 1,079$ $894 + 4,117$

d. $5,182 + 957$ $3,777 + 2,350$

e. $90,652 + 21,911$ $37,888 + 84,675$

f. $54,186 + 11,983$ $25,649 + 40,515$

7. Round to estimate the sum. Then solve the problems and find the exact sum.

Show your steps.

a. Sandra collected 139 cans to recycle.



b. Hani collected 242 cans.

How many cans were collected.

Round to the nearest Ten.

Estimate:

Exact:

- b. A colony of ants is on a march through the jungle looking for food. On this march they made 2 bridges. The first bridge is composed of 142 ants. The second bridge is composed of 165 ants.

How many ants were there in both bridges ?

Show your work. Then, explain how you know your answer is reasonable.

Estimate :

Exact :



- c. Abeer and Ehab are traveling from Aswan to Alexandria. They will travel 514 km on the first day to Asyut. They will travel 597 km from Asyut to Alexandria on the second day. How many kilometers will they travel in all ?



Estimate :

Exact :

- d. A Saharan silver ant is the fastest ant on the planet. It can move about 855 mm a second. If this ant could maintain this speed for 2 seconds, how far would it go ?



Estimate :

Exact :

- e. A factory produced 7,560 toys in one month. If the factory produced the same number each month. How many toys were produced in two months ? Round to the nearest Thousand.



Estimate :

Exact :

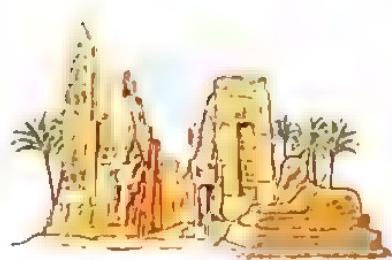
- f. In a week 6,923 tourists visited Karnak temple, and in the next week 7,679 tourists visited it.

How many tourists visited the temple in the two weeks?

Round to the nearest Ten

Estimate:

Exact:



- g. The number of spectators in three successive matches of the Egyptian team in Cairo stadium were 17,846, 48,928 and 32,135.

Find the total number of spectators in the three matches.

Round to the nearest Ten Thousands.

Estimate:

Exact:



Challenge

8. Complete the missing digits.

a.

$$\begin{array}{r}
 7 \quad \boxed{} \quad 3 \quad 4 \quad \boxed{} \\
 + \quad \boxed{} \quad 2, \quad \boxed{} \quad 2 \quad 5 \\
 \hline
 9 \quad 8, \quad 6 \quad \boxed{} \quad 8
 \end{array}$$

b.

$$\begin{array}{r}
 \boxed{} \quad 0, \quad 1 \quad \boxed{} \quad \boxed{} \\
 + \quad 1 \quad \boxed{}, \quad \boxed{} \quad 2 \quad 5 \\
 \hline
 3 \quad 7, \quad 6 \quad 4 \quad 8
 \end{array}$$

c.

$$\begin{array}{r}
 4, \quad 7 \quad 1 \quad 4 \\
 + \quad \boxed{}, \quad 4 \quad \boxed{} \quad 5 \\
 \hline
 8, \quad \boxed{} \quad 6 \quad \boxed{}
 \end{array}$$

d.

$$\begin{array}{r}
 2 \quad \boxed{}, \quad 3 \quad 8 \quad \boxed{} \\
 + \quad \boxed{} \quad 9, \quad 5 \quad \boxed{} \quad 4 \\
 \hline
 8 \quad 4, \quad \boxed{} \quad 2 \quad 5
 \end{array}$$

9. Round to estimate to check the reasonableness of your answer. Find the exact sum.

$$44,536 + 18,312 + 22,305 + 10,943$$

Multiple Choice Questions

Choose the correct answer.

1. Which one is the sum of $\underline{352} + \underline{269}$?

- A. 117 B. 118
C. 621 D. 622

3. Which one is the correct rounding to estimate the answer to $192 + 266$?
 $A. 100 + 200 = 300$
 $B. 200 + 200 = 400$
 $C. 100 + 300 = 400$
 $D. 200 + 300 = 500$

5. Which one is the sum of $\underline{4,568} + \underline{2,715}$?
 $A. 2,253$
 $B. 6,283$
 $C. 7,273$
 $D. 7,283$

7. $3,425 + 4,768 = 193 +$ _____
 $A. 8$
 $B. 80$
 $C. 800$
 $D. 8,000$

9. Which has the same sum as $654 + 1,698$?
 $A. 519 + 1,832$
 $B. 1,394 + 958$
 $C. 1,863 + 571$
 $D. 754 + 1,898$

11. Heba bought a laptop for 13,350 pounds and a TV set for 8,750 pounds.
What is the total money did she pay?
 $A. 21,000$ pounds $B. 21,100$ pounds
 $C. 22,100$ pounds $D. 23,000$ pounds

13. Which of the following estimations could be used to check $29,828 + 41,309 = 71,137$ is reasonable?
 $A. 20,000 + 40,000 = 60,000$
 $B. 20,000 + 50,000 = 70,000$
 $C. 30,000 + 40,000 = 70,000$
 $D. 30,000 + 50,000 = 80,000$

2. Which one is the rounding to the nearest Hundred of 3,783 ?

- A. 3,780 B. 3,800
C. 3,880 D. 4,000

4. Which one is the correct rounding to estimate the sum of $1,564 + 387$?
 $A. 1,500 + 300 = 1,800$
 $B. 1,500 + 400 = 1,900$
 $C. 1,600 + 400 = 2,000$
 $D. 1,600 + 500 = 2,100$

6. Which one is the sum of $\underline{58,607} + \underline{24,654}$?
 $A. 83,053$
 $B. 83,261$
 $C. 83,361$
 $D. 83,853$

8. $31,632 + 62,435 =$ _____
 $A. 67 + 94$
 $B. 67 + 940$
 $C. 67 + 9,400$
 $D. 67 + 94,000$

10. $78,912$ _____ $71,147 + 7,765$
 $A. >$
 $B. <$
 $C. =$

12. $\begin{array}{r} 25,441 \\ + 36,822 \\ \hline + 29,789 \\ \hline \end{array}$
 $A. 91,052$
 $B. 92,052$
 $C. 92,642$
 $D. 93,052$

14. In a fruit farm, there are 4,275 mango trees and 3,816 orange trees. Which of the following estimations could be used to check the total number of trees is reasonable?
 $A. 4,000 + 3,000 = 7,000$
 $B. 4,000 + 4,000 = 8,000$
 $C. 5,000 + 3,000 = 8,000$
 $D. 5,000 + 4,000 = 9,000$

2-4 Subtraction Strategies

2-5 Subtraction with Regrouping

Learn Subtraction strategies

On Thursday, the number of the metro passengers was 6,543.
On Friday it was 3,226.

Find the difference between the number of passengers in the two days.

Subtract: $6,543 - 3,226$



One Way Counting down using number line with decomposing strategy

To find the difference : $6,543 - 3,226$ do the following steps :

Step 1

- Draw a number line without marks, write the minuend [the greater number] at the right side on the number line.



Step 2

- Decompose the subtrahend [the smaller number] in expanded form.

$$3,226 = 3,000 + 200 + 20 + 6$$

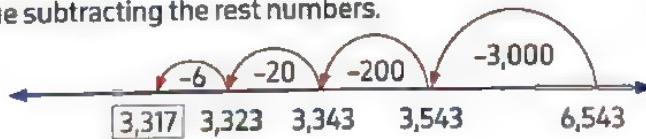
Step 3

- Make a hop on the number line to subtract [count down] the highest value in the expanded form. Record the different under the number line.



Step 4

- Continue subtracting the rest numbers.

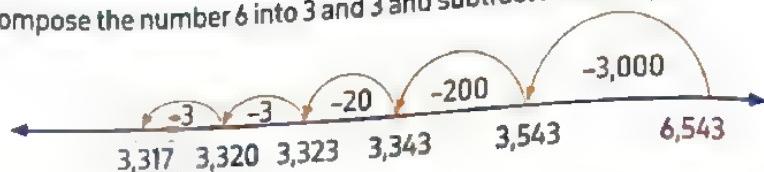


► The difference is the number you got. So, $6,543 - 3,226 \approx 3,317$ then, the difference is 3,317 passengers.

- Remind your child how he/she write any number in expanded form. This will help him/her to apply decomposing strategy to subtract

Notes

- In the last hop, you may decompose the number 6 into 3 and 3 and subtract in two hops.

**Another Way Counting on using number line with decomposing strategy**

To find the difference : $6,543 - 3,226$ do the following steps :

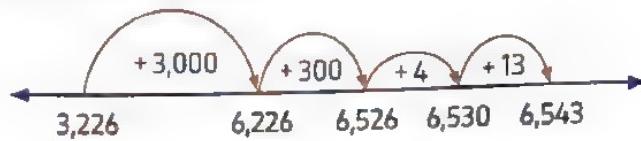
Step 1

- Draw a number line without marks, write the subtrahend [the smaller number] at the left side on the number line.

**Step 2**

- Use addition [counting up] and make hops on the number line to get the minuend

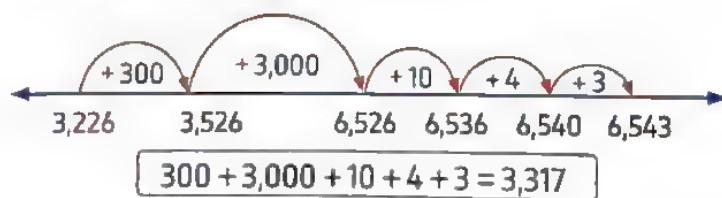
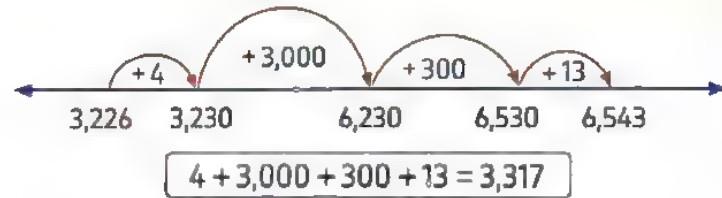
Hint : [You can make different hops with any numbers].

**Step 3**

- Add the numbers above the number line to find the difference.

$$3,000 + 300 + 4 + 13 = 3,317$$

So, $6,543 - 3,226 = 3,317$

Different ways to count up**Notes for parents :**

- Let your child choose his/her favorite ways to count up.

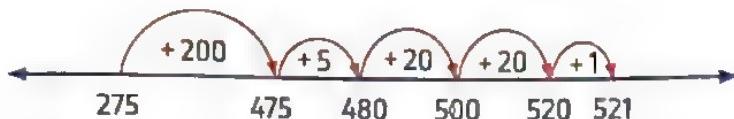
Example 1

Find the difference. $521 - 275$

Solution 

$$\text{So, } 521 - 275 = 246$$

Another way



$$\text{So, } 200 + 5 + 20 + 20 + 1 = 246$$



Check your understanding

Solve the following problems using a strategy of your choice.

a. $952 - 687 = \underline{\hspace{2cm}}$



b. $6,357 - 2,467 = \underline{\hspace{2cm}}$



* Help your child to solve "check your understanding" using any strategy. Ask him/her why he/she choose to answer using this strategy

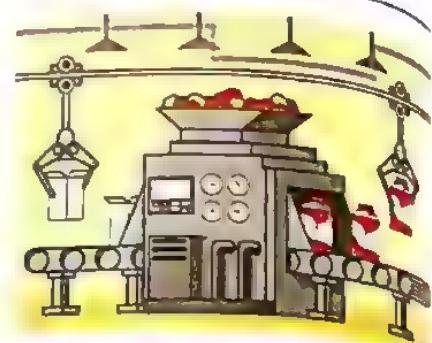
Learn Subtraction with regrouping

A factory produced 3,675 cartons of juice in a month. In the next month, the factory produced 7,869 cartons of juice.

Find the difference between the number of cartoon of juice in the two months.

Subtract: $7,869 - 3,675$

Estimate: $8,000 - 4,000 = 4,000$ [Round to the nearest Thousand]



Use the standard subtraction algorithm.

Step 1	Step 2	Step 3	Step 4
Subtract the ones.	Regroup hundreds. Subtract the tens.	Subtract the hundreds.	Subtract the thousands.
$ \begin{array}{r} 7 & 8 & 6 & 9 \\ - 3 & 6 & 7 & 5 \\ \hline 4 \end{array} $	$ \begin{array}{r} \overset{7}{\cancel{1}} \overset{16}{\cancel{6}} \\ \overset{7}{\cancel{8}} \overset{\cancel{6}}{\cancel{5}} \overset{9}{\cancel{9}} \\ - 3, 6, 7, 5 \\ \hline 9, 4 \end{array} $	$ \begin{array}{r} \overset{7}{\cancel{1}} \overset{16}{\cancel{6}} \\ \overset{7}{\cancel{8}} \overset{\cancel{6}}{\cancel{5}} \overset{9}{\cancel{9}} \\ - 3, 6, 7, 5 \\ \hline 1, 9, 4 \end{array} $	$ \begin{array}{r} \overset{7}{\cancel{1}} \overset{16}{\cancel{6}} \\ \overset{7}{\cancel{8}} \overset{\cancel{6}}{\cancel{5}} \overset{9}{\cancel{9}} \\ - 3, 6, 7, 5 \\ \hline 4, 1, 9, 4 \end{array} $

So, the difference is 4,194 cartons of juice

The answer is close to the estimate, so 4,194 is reasonable.

Note that :

- If the numbers were rounded to the nearest Hundred to estimate.

$$7,869 - 3,675$$



$$7,900 - 3,700 = 4,200 \text{ (it is more closer to the exact answer)}$$

- If the numbers were rounded to the nearest Ten to estimate.

$$7,869 - 3,675$$



$$7,870 - 3,680 = 4,190 \text{ (it is more closer to the exact answer than rounding to Thousand and rounding to Hundred)}$$

Notes for parents :

- The exact answer is more reasonable to estimation using rounding to the nearest 10 than rounding to the nearest other place values.

Example 2

Find the difference. Round to the given estimation to check the reasonableness of the answer.

a. $531 - 278$ [Round to the nearest Ten]

b. $7,419 - 1,742$ [Round to the nearest Hundred]

Solution

a.

$$\begin{array}{r} \cancel{4} \cancel{2} \cancel{1} \\ 5 \cancel{3} 1 \\ - 2 7 8 \\ \hline 2 5 3 \end{array} \xrightarrow{\text{Round to 10}} \begin{array}{r} 4 \cancel{1} 3 \\ 5 \cancel{3} 0 \\ - 2 8 0 \\ \hline 2 5 0 \end{array}$$

[The answer is reasonable]

b.

$$\begin{array}{r} \cancel{6} \cancel{1} \cancel{1} \\ \cancel{7} \cancel{4} \cancel{9} \\ - 1 7 4 2 \\ \hline 5, 6 7 7 \end{array} \xrightarrow{\text{Round to 100}} \begin{array}{r} 6 \cancel{1} 4 \\ 7 \cancel{4} 0 0 \\ - 1, 7 0 0 \\ \hline 5, 7 0 0 \end{array}$$

[The answer is reasonable]

Example 3

Estimate using rounding to the nearest 10, 100, 1,000 and 10,000 to check the reasonableness of the answer. Find the exact difference. $46,853 - 19,729$

Solution

• Round to nearest 10 :

$$\begin{array}{r} 3 16 \\ 46,850 \\ - 19,730 \\ \hline 27,120 \end{array}$$

• Round to nearest 100 :

$$\begin{array}{r} 3 16 \\ 46,900 \\ - 19,700 \\ \hline 27,200 \end{array}$$

• Round to nearest 1,000 :

$$\begin{array}{r} 47,000 \\ - 20,000 \\ \hline 27,000 \end{array}$$

• Round to nearest 10,000 :

$$\begin{array}{r} 50,000 \\ - 20,000 \\ \hline 30,000 \end{array}$$

Exact difference

$$\begin{array}{r} 3 16 \quad 4 13 \\ 46,853 \quad 19,729 \\ - 19,729 \\ \hline 27,124 \end{array}$$

The exact difference is more reasonable to estimation using rounding to the nearest 10 than rounding to 100, 1,000 or 10,000

**check!** your understanding

Solve the following problems using the standard subtraction algorithm.

Then, round each number to the nearest Tens, Hundred Thousands or Ten Thousands to check the reasonableness of your answers.

a. $4,271 - 1,834$

b. $52,329 - 31,255$

c. $608,452 - 109,786$

- Remind your child to look at each exercise carefully and decide how he/she needs to regroup before proceeding

Exercise 10

2-4 Subtraction Strategies

2-5 Subtraction with Regrouping

REMEMBER

PROBLEM SOLVING

From the school book

1. Solve the following problems using counting down using number line with decomposing strategy.

a. $841 - 266$



b. $5,612 - 1,505$



2. Solve the following problems using counting on using number line with decomposing strategy.

a. $972 - 586$



b. $6,275 - 3,761$



3. Solve the following problems using a strategy of your choice.

strategies may vary

a. $\begin{array}{r} 734 \\ - 243 \\ \hline \end{array}$



b. $\begin{array}{r} 839 \\ - 199 \\ \hline \end{array}$



c. $\begin{array}{r} 6,245 \\ - 2,400 \\ \hline \end{array}$



d. $\begin{array}{r} 5,200 \\ - 2,201 \\ \hline \end{array}$



e. $\begin{array}{r} 27,340 \\ - 18,930 \\ \hline \end{array}$



4. Use the standard subtraction algorithm to solve the problems. Then, round each number to the nearest Thousand to check the reasonableness of your answer.

a.
$$\begin{array}{r} 9,263 \\ - 3,842 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 6,625 \\ - 4,417 \\ \hline \end{array}$$

c.
$$\begin{array}{r} 1,816 \\ - 1,066 \\ \hline \end{array}$$

d.
$$\begin{array}{r} 5,734 \\ - 3,568 \\ \hline \end{array}$$

e.
$$\begin{array}{r} 25,884 \\ - 18,875 \\ \hline \end{array}$$

f.
$$\begin{array}{r} 31,070 \\ - 2,523 \\ \hline \end{array}$$

g.
$$\begin{array}{r} 46,835 \\ - 19,727 \\ \hline \end{array}$$

h.
$$\begin{array}{r} 13,524 \\ - 4,786 \\ \hline \end{array}$$

i.
$$\begin{array}{r} 24,305 \\ - 3,071 \\ \hline \end{array}$$

j.
$$\begin{array}{r} 23,640 \\ - 14,635 \\ \hline \end{array}$$

k.
$$\begin{array}{r} 76,053 \\ - 5,296 \\ \hline \end{array}$$

l.
$$\begin{array}{r} 85,009 \\ - 42,879 \\ \hline \end{array}$$

m.
$$\begin{array}{r} 62,450 \\ - 46,786 \\ \hline \end{array}$$

n.
$$\begin{array}{r} 714,523 \\ - 128,104 \\ \hline \end{array}$$

o.
$$\begin{array}{r} 538,109 \\ - 321,299 \\ \hline \end{array}$$

p.
$$\begin{array}{r} 865,400 \\ - 22,876 \\ \hline \end{array}$$

q.
$$\begin{array}{r} 190,123 \\ - 75,425 \\ \hline \end{array}$$

r.
$$\begin{array}{r} 267,205 \\ - 53,685 \\ \hline \end{array}$$

s.
$$\begin{array}{r} 680,000 \\ - 124,572 \\ \hline \end{array}$$

t.
$$\begin{array}{r} 17,900,000 \\ - 2,241,839 \\ \hline \end{array}$$

5. Use the standard subtraction algorithm to solve the following problems. Then round to the nearest Thousands to check the reasonableness of your answer as the examples.

► Examples : $\begin{array}{r} 4,714 \\ - 2,873 \\ \hline 5,000 - 3,000 = 2,000 \end{array}$

$\begin{array}{r} 713,310 \\ - 58,336 \\ \hline 83,000 - 58,000 = 25,000 \end{array}$

a. $2,654 - 1,431 = \underline{\hspace{2cm}}$

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

b. $3,458 - 2,064 = \underline{\hspace{2cm}}$

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

c. $5,487 - 152 = \underline{\hspace{2cm}}$

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

d. $7,326 - 5,296 = \underline{\hspace{2cm}}$

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

e. $76,452 - 52,131 = \underline{\hspace{2cm}}$

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

f. $70,623 - 30,611 = \underline{\hspace{2cm}}$

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

g. $32,975 - 18,943 =$
- =

i. $58,462 - 286 =$
- =

k. $238,763 - 18,764 =$
- =

m. $542,302 - 281,976 =$
- =

h. $49,438 - 36,776 =$
- =

j. $53,670 - 2,558 =$
- =

l. $853,004 - 45,878 =$
- =

n. $721,010 - 350,891 =$
- =

6. Find the results, complete using ($>$, $<$ or $=$).

a. $849 - 598$ $1,000 - 750$

b. $7,532 - 774$ $3,580 - 3,090$

c. $86,432 - 27,653$ $79,493 - 20,715$

d. $18,654 - 367$ $10,000 + 8,000 + 200 + 80 + 7$

e. $12,926 + 19,809$ $57,400 - 24,865$

f. $469,963 - 159,879$ $310,000 + 100$

7. Solve the following story problems using a strategy of your choice.

Follow the orders when rounding to check the reasonableness of your answer.

a. Mona saved 834 pounds in a month. Her sister

∴

Sara saved 468 pounds in the same month.

Find the difference between their savings.

Round to the nearest Ten to estimate.



- b. A farmer collected 9,732 watermelons.
 He sold 3,995 pieces. What is the number of left watermelons?

Round to the nearest Thousands to estimate.



- c. Eslam needs 1,372 pieces to put his puzzle together. If he has 685 pieces. How many pieces are needed to complete his puzzle?

Round to the nearest Hundreds to estimate.



- d. A trap jaw ant wanted to cross a river that was 3,548 cm across. The ant had already swum 1,672 cm. How much farther does the ant have to go?
-
-
-



- e. Two colonies of fire ant were stuck in a flood and made floating rafts to survive. The first colony had approximately 1,267 ants and the second had 3,452 ants. How many more ants were in the second colony?
-
-
-



- f.** The number of births in a governorate in one month was 46,252 births. The number of births in another governorate in the same month was 53,543 births. What is the difference between the number of births in the two governorates? Round to the nearest thousands to estimate.



- g.** A fire ant colony has 255,000 ants. A Gigantiops destructor ant colony has 6,200 ants. What is the difference between the size of the two colonies?



- h.** It takes 15,422,140 ants to move a log that weighs 77 kg. It takes approximately 6,350,300 ants to move a rock that weighs 32 kg. How many more ants does it take to move the log than the rock?

Round to the nearest 1 million to estimate.



Challenge

- 3. Write the missing digits.**

a.

$$\begin{array}{r}
 & \boxed{} & 3 & \boxed{} & 7 \\
 - & 5 & \boxed{} & 7 & \boxed{} \\
 \hline
 3 & 0 & 2 & 4
 \end{array}$$

b.

$$\begin{array}{r}
 \boxed{} & 3 & 6 & 4 \\
 - & 1 & 2 & \boxed{} & 5 \\
 \hline
 1 & \boxed{} & 3 & \boxed{}
 \end{array}$$

Multiple Choice Questions

Choose the correct answer.

1. Find the difference $\underline{\quad 879 \quad} - \underline{\quad 463 \quad}$

- A. 313
- B. 413
- C. 416
- D. 1,342

2. Find the difference $\underline{\quad 457,206 \quad} - \underline{\quad 124,680 \quad}$

- A. 332,486
- B. 332,526
- C. 333,486
- D. 333,526

3. Which one has the answer 23,837?

- A. $37,521 - 12,684$
- B. $36,521 - 12,684$
- C. $36,521 - 13,684$
- D. $38,521 - 13,684$

4. Salma solves this problem $\underline{\quad 2,524 \quad} - \underline{\quad 1,352 \quad}$ What is her next step?

- A. Add 2 and 5 in the tens place.
- B. Subtract 5 from 2 in the tens place.
- C. Regroup the tens place and subtract 5 from 12
- D. Regroup the tens place and subtract 5 from 11

5. Which choice shows how you would correctly use rounding to estimate a reasonable answer to the problem $537 - 259$?

- A. $520 - 250 = 270$
- B. $530 - 240 = 290$
- C. $540 - 260 = 280$
- D. $540 - 250 = 290$

6. Amira solved the following problem $\underline{\quad 6,219 \quad} - \underline{\quad 2,858 \quad}$

Then she checked if her answer was reasonable by estimating. She said that her answer is not reasonable because her estimate is $6,000 - 2,000 = 4,000$ what did Amira do wrong?

- A. Amira did not regroup correctly. The difference should have been 3,461
- B. Amira did not round 2,858 correctly. The estimate should be $6,000 - 3,000 = 3,000$
- C. Amira did not round 6,219 correctly. The estimate should be $7,000 - 2,000 = 5,000$
- D. Amira did not do anything wrong. The estimate is close enough to the answer.

7. A shop sold goods for 54,243 pounds and 34,786 pounds in the next day.

- What is the difference between the sales in the two days?
- A. $54,243 - 34,786 = 20,543$ pounds.
- B. $54,243 - 34,786 = 19,457$ pounds.
- C. $54,243 + 34,786 = 88,929$ pounds.
- D. $54,243 + 34,786 = 89,029$ pounds.

Concept 1 Assessment



1. Put (✓) to the correct answer and (✗) to the incorrect answer.

- a. $(18 - 2) + 23 = 18 - (2 + 23)$ []
- b. To subtract $170 - 79$ mentally, use compensation strategy and subtract $170 - 80$, then subtract 1 to find that $170 - 79$ equals 91 []
- c. The estimate could be used to find $(9,528 - 3,761 = 5,767)$ is $9,530 - 3,760 = 5,770$ to check the answer is reasonable. []
- d. A student writes the statement $87 - 62 = 62 - 87$ because the commutative property applies to subtraction. []
- e. To complete solving the subtraction problem $\begin{array}{r} 628 \\ - 173 \\ \hline 5 \end{array}$, you should regroup the Tens place and subtract 7 from 12, then subtract 1 from 5. []
- f. $25,437 + 37,485 = 62,912$ []

2. Choose the correct answer.

- a. $2,785 + 0 = 2,785$ is used _____ property.
 - A. commutative
 - B. associative
 - C. additive identity
- b. $354 + [116 + 243] = [354 + \underline{\hspace{2cm}}] + 243$
 - A. 354
 - B. 116
 - C. 243
 - D. 359
- c. $35,896 + 31,568 \underline{\hspace{2cm}} 82,063 - 14,589$
 - A. >
 - B. <
 - C. =
- d. Which choice shows how you would correctly use rounding to estimate a reasonable answer to the problem $726 - 248$?
 - A. $720 - 240 = 480$
 - B. $720 - 250 = 470$
 - C. $730 - 240 = 490$
 - D. $730 - 250 = 480$
- e. $16 + 27 = 16 + [30 - 3]$, the used strategy is _____
 - A. break up and bridge
 - B. compensation
 - C. add to subtract
 - D. front-end estimation
- f. Find the sum $\begin{array}{r} 364,731 \\ + 259,189 \\ \hline \end{array}$
 - A. 105,542
 - B. 115,658
 - C. 623,920
 - D. 623,930

3. Complete.

- a. The estimated sum using rounding to the nearest 10 to find the answer of $7,346 + 1,983$ is $\underline{\quad} + \underline{\quad} = \underline{\quad}$ and the exact answer is $\underline{\quad}$
- b. $563,200 - 219,876 = \underline{\quad}$
- c. To subtract $250 - 59$ mentally using compensation, subtract $\underline{\quad}$ than add $\underline{\quad}$ to the answer equals $\underline{\quad}$
- d. $295,246 - 222,876 = \underline{\quad}$
- e. The difference between 214 and 189 is $\underline{\quad}$
- f. The sum of 12,985, 36,524 and 10,246 is $\underline{\quad}$

4. Match the cards that have the same answer.

- | | |
|----------------------|----------------------|
| a. $2,568 + 4,895$ | 1. $42,248 + 35,529$ |
| b. $81,145 - 3,368$ | 2. $1,258 + 6,549$ |
| c. $69,963 - 59,863$ | 3. $8,888 - 1,425$ |
| d. $5,648 + 2,159$ | 4. $8,569 + 1,531$ |

5. Rana found that $45,378 + 12,861 = 58,239$ then she checked if her answer was reasonable.

- by estimating she said that her answer is not reasonable because her estimate is $46,000 + 13,000 = 59,000$.

What did Rana do wrong? Describe her error.

6. How do you use a number line to find the difference between 532 and 168. Show your answer on a number line.

7. Choose one of mental math strategy to solve the problem $182 + 245$. Show your steps.8. Show how you use associative and commutative properties to solve $(23 + 16) + 17$.

- Show your steps.

9. Nader's salary is 10,250 pounds. He spent 5,575 pounds. Calculate the left money.

- Estimate using rounding to check the reasonableness of the answer.

10. Find the value of $214 - 79$ mentally. Explain your used strategy.

11. A store sold 52,447 toys in a month. If the store sold the same number of toys each month.

- Calculate the number of the total sold toys in two months. Estimate using rounding to check the reasonableness of the answer.

12. Youssef wrote $3,458 - 2,064 = 1,414$ What did Youssef do wrong? Describe his error.

- Estimate using rounding to check the reasonableness of the answer.

Concept

2

Solving Multistep Problems



Fast Fact

Female kangaroos sport a pouch on their belly (made by a fold in the skin) to cradle baby kangaroos, called joeys.

If a female weighs 35 kg, and weighs holding her joey 38 kg.
What is the weight of her joey ?



Concept Overview

In concept 2:

Solving Multistep Problems, students review and explore multistep problem-solving strategies, including math modeling strategies. This work helps prepare them for working with larger numbers and provides context for the importance of estimating to check the reasonableness of answers. Although instruction in solving multistep problems continues throughout the course, students focus on fluency of addition and subtraction problems and solving word problems using four functions.



Lesson No	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 5	2-6 Bar Models, Variables, and Story Problems	Bar model-Variable	<ul style="list-style-type: none">Students will use letters to represent unknown quantities in equations.Students will use bar models to represent and solve story problems.Solve for the variable in an equation.
Lesson 6	2-7 Solving Multistep Story Problems with Addition and Subtraction	Review vocabulary as needed	<ul style="list-style-type: none">Students will solve multistep story problems.Students will explain how they solved multistep story problems.

2-6 Bar Models, Variables, and Story Problems

(Learn)

How do you write a number sentence to solve a problem?

Suppose you had 225 L.E. to spend.
How much money would you have left if you bought the soccer socks?

Soccer Gear Sale!	
soccer socks	90 L.E.
Goalie gloves	120 L.E.
shinguards	225 L.E.

You can spend 225 L.E. The socks cost 90 L.E.
Find how much money you will have left.

Read and Understand

What do you know?

What are you trying to find?



Plan and Solve

What strategy will you use?

Strategy : Write a Number Sentence using bar models.



To find the missing part:

1. Write a number sentence (or equation).

$$90 + n = 225 \quad (n \text{ shows the money left})$$

2. Subtract to find the part

$$n = 225 - 90$$

$$n = 135$$

Answer : You will have 135 L.E. left.

Look Back and Check

Is your answer reasonable? $90 + 135 = 225$ Yes, it checks.

Notes for parents :

- Ask your child why is subtraction used for this problem? He/she may answer "subtraction is used because I need to find the part that is left".

Identifying the Main Idea

Identifying the main idea when you read in math can help you use the problem-solving strategy, and write a number sentence.

In reading, identifying the main idea helps you know what the story is about.

In math, the main idea for some word problems is part-part-whole with either a part or the whole unknown.

The main idea here is part-part-whole, with the whole unknown.



Nader spent 7 L.E. in Monday and 8 L.E. in Tuesday. How much did he spend in all on both days?



- Equation $7 + 8 = n$
 - Add to find the whole.
- | | | |
|------|------|-------|
| Part | Part | Whole |
| 7 | + 8 | = n |

Sally had 10 L.E. After she bought a book, she had 4 L.E. left. What did the book cost?



- Equation $n + 4 = 10$
 - Subtract to find a part.
- | | | |
|-------|------|------|
| Whole | Part | Part |
| 10 | - 4 | = n |

The main idea here is part-part-whole, with the one part unknown.



Each picture shows the main idea. The main idea helps you know what number sentence to write.

If your child has trouble writing number sentences for problems, tell him/her to figure out the main idea in the problem, draw a picture for it, and then decide which operation it calls for.

Example 1

There are 5,526 bees in a hive.

In this hive 3,491 are males and the rest are females.

How many females in this hive?

Solution

- The whole is : 5,526
- One part is : 3,491 [males]

- The second part is unknown : x [females]

- Bar model:



- Equation: $3,491 + x = 5,526$

- ^(4.12) Solution: $x = 5,526 - 3,491 = 2,035$ females.

to write a Number sentence (or equation)

Step 1 Show the main idea.

Step 2 Decide which operation fits the main idea

Step 3 Use a letter to show what you are trying to find.

Step 4 Solve the number sentence.

Note

You can write many equations for this problem

$$3,491 + x = 5,526$$

$$x + 3,491 = 5,526$$

$$5,526 - 3,491 = x$$

or

$$5,526 - x = 3,491$$

The value of x is the same.

**Check your understanding**

If the number of visitors of the Pyramids in one month is 183,523 and the number of foreign visitors is 38,191

Find the number of Egyptian visitors.

Bar model

Equation: _____

Solution:

**Notes for parents :**

- If your child writes only the answer, ask him/her to reread the directions, and ask him/her to write a number sentence that includes a letter stands for the unknown.

Learn Solving equations with variables

- An equation is a number sentence stating that two amounts are equal.
- An equation is true if the values on both sides of the equal sign are equal. You solve an equation when you find the value of the variable that makes the equation true.

Example 2

Solve the equation : $14 - d = 8$

Solution 

• Bar model:

14	
d	8

• Solution : $d = 14 - 8 = 6$

Example 3

Solve the equation : $y - 34,500 = 55,200$

Solution 

• Bar model:

y	
34,500	55,200

• Solution : $y = 34,500 + 55,200 = 89,700$

Example 4

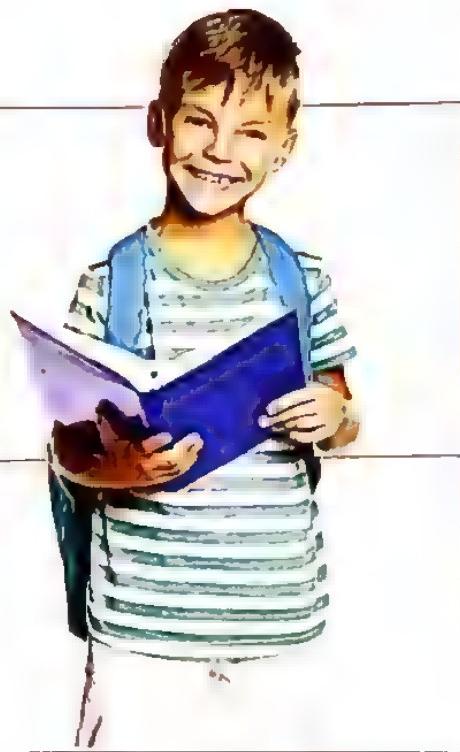
Solve the equation : $74,562 + m = 125,708$

Solution 

• Bar model:

125,708	
74,562	m

• Solution : $m = 125,708 - 74,562 = 51,146$



Check your understanding

Solve the following equations.

a. $x + 54,600 = 87,623$

c. $p - 4,252 = 31,726$

b. $76,450 - m = 15,412$

d. $13,725 + n = 70,000$

* Ask your child to check his/her answer using fact family.

Exercise 11

2-6 Bar Models, Variables, and Story Problems

REMEMBER

UNDERSTAND

PLAN

PROBLEM SOLVING

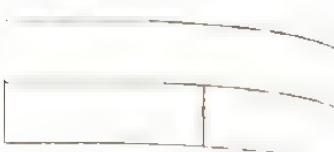
From the school

1. Complete a bar model. Write an equation. Solve the equation.

a. 5 tickets plus some extra tickets are 45 tickets. How many is the number of extra tickets?



b. There are some students. Eight students leave. Now there are 24 students. What is the number of all students?



c. There are 10 dog biscuits in a bowl. After the dogs eat some. There are 3 dog biscuits left. How many dog biscuits did the dogs eat?



d. A service dog has completed 4 months of its 9 months training program. How many months the dog has left to finish its training?



2. Find the value of each variable in the following part-part whole tables.

a.

x	
34,750	19,051

b.

121,725
10,714
y

c.

78,514	
a	29,125

d.

m	
41,621	52,321

3. There are 5,328 ants in the colony. In the colony, 2,164 ants are females and the rest are males. How many male ants are in the colony?

Bar model

Equation:

Solution :



4. In colony A there are 1,200 ants. Some ants are out foraging for food and supplies, and 700 ants are taking out the colony's trash. How many ants are foraging for food and supplies?

Bar model

Equation:

Solution :



5. Mr Mostafa has written 157 pages of a book. He wants the book to have about 550 pages. How many more pages does he need to write?

Bar model

Equation:

Solution :

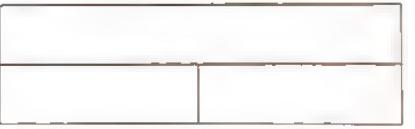


6. There are 12,000 species of ants. Of these 12,000 species, 2,500 species live in Africa and the rest live in other parts of the world. How many species do not live in Africa?

Bar model

Equation:

Solution :



7. The number of boys and girls in a school is 2,340 if the number of boys in this school is 1,234. What is the number of girls in this school?

Bar model

Equation:

Solution :



3. There are 5,328 ants in the colony. In the colony, 2,164 ants are females and the rest are males. How many male ants are in the colony?

Bar model

Equation:

Solution :



4. In colony A there are 1,200 ants. Some ants are out foraging for food and supplies, and 700 ants are taking out the colony's trash. How many ants are foraging for food and supplies?

Bar model

Equation:

Solution :



5. Mr Mostafa has written 157 pages of a book. He wants the book to have about 550 pages. How many more pages does he need to write?

Bar model

Equation:

Solution : -



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Bar model

Equation:

Solution :



7. The number of boys and girls in a school is 2,340 if the number of boys in this school is 1,234. What is the number of girls in this school?

Bar model

Equation:

Solution :



8. Solve the following equations, create a bar model to solve the following problems.

a. $m - 4 = 11$

b. $a + 9 = 13$

c. $12 = 24 - r$

d. $8 = 5 + w$

9. Solving equations with variables. Create a bar model to solve the following problems.

a. $14,000 - n = 6,000$

b. $m - 35,462 = 2,741$

Bar model:

Bar model:

Solution :

Solution :

c. $b - 53,500 = 75,200$

d. $l + 432,750 = 642,781$

Bar model:

Bar model:

Solution :

Solution :

e. $725,625 + c = 935,075$

f. $13,280 - d = 5,420$

Bar model:

Bar model:

Solution :

Solution :

g. $722,561 - p = 720,231$

h. $f + 205,925 = 810,775$

Bar model:

Bar model:

Solution :

Solution :

10. Writing About Math. write a story problem involving addition or subtraction, what

you need to find the unknown. Then write the equation and draw a bar model of the equation. Lastly, solve for the variable and check.

Word Problem

Equation	Bar Model [drawn]	Solve and Check

Challenge

11. Solve the equation by using a bar model.

$$1+1=8$$

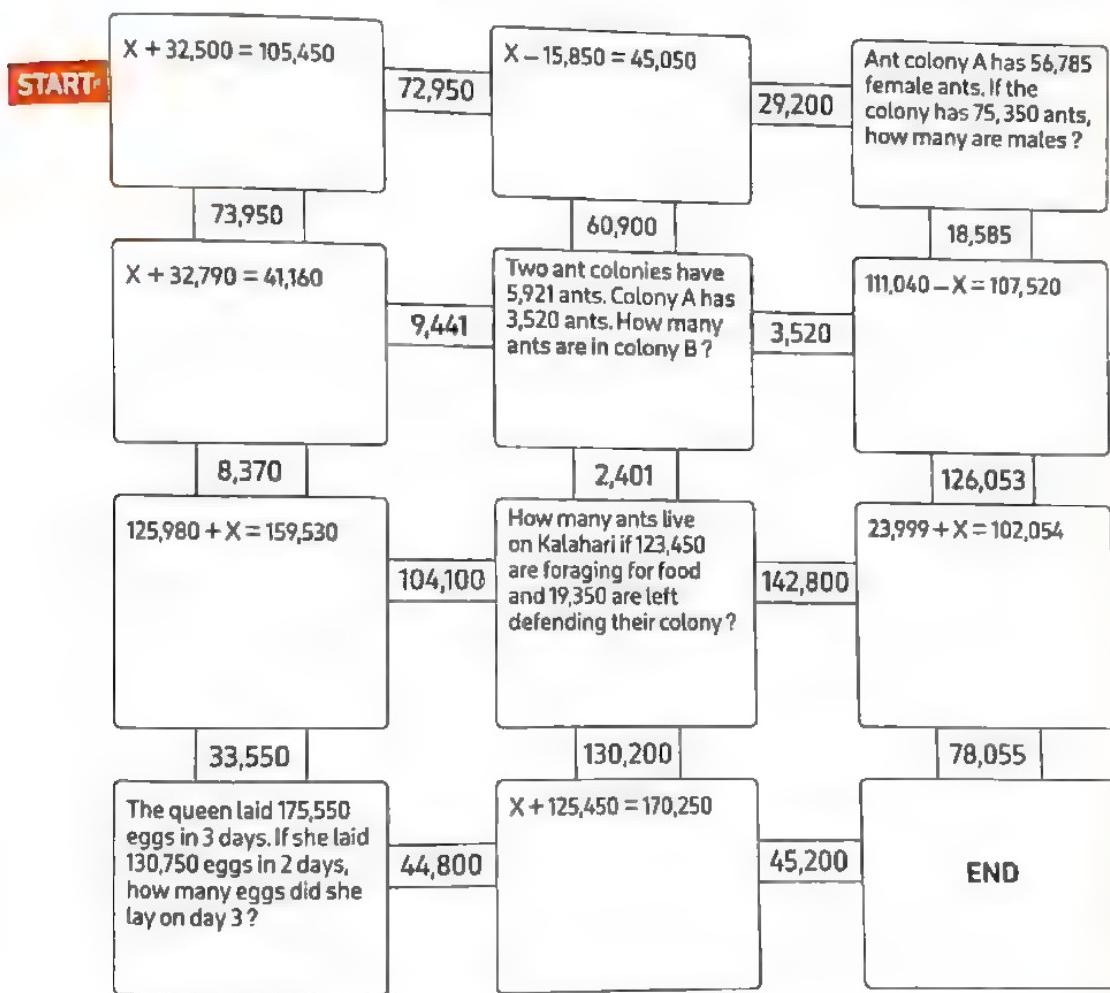


Solution :

12. If $b = m + 4$ and $c + m = 7$ find m and c

Activity

... Your goal is to make it from START to END. Begin in the game space next to START. To move to the next game space, the number in the path MUST be a solution to the game space you are in. You are only required to solve the problems needed to navigate through the puzzle. Use arrows to show the path you took. When you have reached the END, you have completed the maze. Good luck!



Multiple Choice Questions

Choose the correct answer.

1. If $24 = x - 8$, then $x =$

- A. 20
- B. 8
- C. 32
- D. 10

3. If $32,782 + k = 41,262$, then $k =$

- A. 8,562
- B. 8,480
- C. 74,044
- D. 73,916

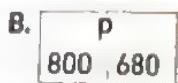
5. If $35,741 - y = 7,425$, then $y =$

- A. 28,316
- B. 43,166
- C. 40,213
- D. 15,730

7. Sara had 374,522 L.E. She bought a car for 271,500 L.E. Then the remainder money with her =

- A. 646,022
- B. 103,022
- C. 107,390
- D. 102,352

9. A train leaves the station with 680 passengers. It picks up more passengers at the next station. The train then has 800 passengers on it. Let p represent the number of passengers who boarded the train at the next station. Which bar model represents this problem?



10. What is the value of x ? $25 + x = 37$

- A. 7
- B. 12
- C. 62
- D. 72

2-7 Solving Multistep Story Problems with Addition and Subtraction

Learn

Some story problems have a **hidden question**.
To solve the problem, you must first find and answer the hidden question.

Problem :

Amgad is reading a book. He reads 96 pages in the first week and 129 pages in the second week. The book has 290 pages.

How many pages are left to read ?



Here are some steps to solving multistep story problems.

1. Circle important numbers and labels.
2. Underline questions.
3. Draw a box around operation clues.
4. Examine the information :
 - What is known ? numbers of readed pages [96 pages, 129 pages], number of book's pages [290 pages]
 - What is unknown ? number of left unreaded pages.
 - What is the hidden question ? "How many pages did Amgad read in the two weeks ?"

5. Use what is known to answer the hidden question.

$$\text{Amgad read} = 96 + 129 = 225 \text{ pages}$$

6. Use the new information to solve the problem and find the unknown.

$$\text{The left pages} = 290 - 225 = 65 \text{ pages}$$

So, these are 65 pages left to read.

Notes for parents :

- Give your child a multi-step story problem and ask your child to use the solving steps to help solving the problem

Another Way

- **Hidden question :** How many pages are left in the first week ?

$$290 - 96 = 194 \text{ pages}$$

- **Final answer :** How many pages are left to read ?

$$194 - 129 = 65 \text{ pages}$$

Example

Read the story problem, identify the hidden question, then solve the problem.

Sara had 550,000 pounds. She bought a car for 235,865 pounds and a mobile for 7,999 pounds.
How many pounds are left with Sara ?

Solution

Hidden question : How many pounds are paid for the car and the mobile ?

$$235,865 + 7,999 = 243,864 \text{ pounds}$$

Final answer : $550,000 - 243,864 = 306,136$ pounds.

The lefted money with Sara is 306,136 pounds.



Check

your understanding

Read the story problem, identify the hidden question then, solve the problem.

A library sold 25,325 books in the first week, 19,712 books in the second week and 28,119 in the third week. If the library had 473,590 book. How many books are left ?

Notes for parents :

- Let your child to tell you a multistep story problem has a hidden question and ask him/her to find the answer.

Exercise
12

2-7 Solving Multistep Story Problems with Addition and Subtraction

REMEMBER

UNDERSTAND

PLAN

PROBLEM SOLVING

From the school book

1. Read the story problem. Next, read the steps to solve the problem. Number the steps from 1 to 6 to put them in the correct answer.

Ahmed had a pie with 340 calories for breakfast. Then, Ahmed had a glass of milk, an apple, and a chicken sandwich for lunch.

The milk had 190 calories, the apple had 85 calories, and the chicken sandwich had 255 calories. If the average adult can eat 2,000 calories per day, how many more calories can Ahmed eat today?

Subtract 870 from 2,000. The answer is 1,130, so Ahmed can eat 1,130 more calories today.

Draw a box around "How many more".

Add the calories of the foods Ahmed has eaten to answer the hidden question [how many calories Ahmed has already eaten]. The answer is 870 calories.

Circle 340 calories, 190 calories, 85 calories, 255 calories, and 2,000 calories.

Identify the known information [What Ahmed ate and how many calories each item had, the average adult is supposed to eat 2,000 calories per day].

Identify the unknown information [how many calories Ahmed has already eaten' how many more calories Ahmed can eat].

Underline "how many more calories should Ahmed eat today?".

2. Use the problem-solving steps to solve the story problems. Remember, you will have to

- answer the hidden question first and then answer the main question. Be sure to show your work.

- a. Sara, Bassem and Mina are collecting stamps. Sara collected 743 stamps, Bassem collected 198 stamps and Mina collected 357 stamps. How many more stamps did Sara collect than Bassem and Mina have combined?

- b. The Nile River is approximately 6,650 kilometers long. Kareem and his family travel the Nile River from one end to the other end. If they travel 1,075 kilometers in January, then 1,120 kilometers in February, and then 1,325 kilometers in March, how many more kilometers do they still need to travel to reach the other end?
-
- c. A factory sold 6,580 toys in the first month, 7,214 toys in the second month, and 5,975 toys in the third month. They expect to sell 25,000 toys by the end of the fourth month. How many toys are needed to be sold in the fourth month to reach this count?
-
- d. The ant colony website hopes that a new colony A with up to 173,500 will form. If a colony of 27,385 ants and a colony of 52,890 ants join the new colony, how many more ants can join?
-
- e. Hazem and Menna are monitoring ant colonies on the website. Hazem has been monitoring an ant colony with 132,890 ants. Menna has been monitoring an ant colony with 57,024 ants and another colony with 72,999 ants. Who has been monitoring more ants? How many more?
-
- f. The Great Pyramid had 59,000 visitors in January, 27,525 visitors in February, and 32,975 visitors in March. They expect to have 150,000 visitors by the end of April. How many visitors need to show up in April to reach this count?
-

- g. (.) New Valley has a population of 256,088. If Matrouh has a population of 429,999 and South Sinai has a population of 108,951, how many more people do Matrouh and South Sinai have combined than New Valley ?
-

- h. (.) Aswan has a population of 1,575,914. If Luxor has a population of 1,333,309 and Red Sea has a population of 383,796, how many more people do Luxor and Red Sea have combined than Aswan ?
-

Challenge

3. The following table represents the number of shirts in stock of a store.

Answer the following problems.

- a. How many more red shirts than green shirts ?
-
-

	Green	Red
Small	15,436	18,421
Medium	33,142	43,218
Large	5,347	14,132

- b. How many more small shirts than large shirts ?
-
-

- c. How many more medium shirts than large shirts ?
-
-

Multiple Choice Questions

Choose the correct answer.

- 1.** Nada was counting ants in a colony. She counted 3,785 ants on Monday and 1,525 ants on Tuesday. If there are 10,520 ants in this colony. How many ants still to count?

- A. 3,210 ants B. 4,210 ants
C. 5,210 ants D. 6,210 ants

- 3.** A water truck was filled with 4,000 liters of water. It delivered 1,250 liters to its first client. It delivered 620 liters to its second client. It delivered 2,120 liters to its last client. How much water was left in the truck?

- A. 10 liters B. 50 liters
C. 2,130 liters D. 7,990 liters

- 5.** Sara opened her flower shop in the morning with 92 arrangements available to sell. She sold 15 in the morning, 29 in the afternoon, and still had some left at the end of the day. How can you find the number of flower arrangements that were left at the end of the day?

Select two correct answers.

- A. Subtract the 15 arrangements she sold in the morning from the 92 total Sara had at the beginning of the day. Then subtract the 29 flower arrangements she sold in the afternoon.
- B. Add the 15 arrangements she sold in the morning to the 92 total Sara had at the beginning of the day. Then subtract the 29 flower arrangements she sold in the afternoon.
- C. Subtract the 29 arrangements she sold in the afternoon from the 92 total Sara had at the beginning of the day. Then subtract the 15 flower arrangements she sold in the morning.
- D. Add the 29 arrangements she sold in the afternoon to the 92 total Sara had at the beginning of the day. Then subtract the 15 flower arrangements she sold in the morning.
- E. Add the 15 arrangements she sold in the morning to the 92 total Sara had at the beginning of the day. Then add the 29 flower arrangements she sold in the afternoon.
- F. Add the 29 arrangements she sold in the afternoon to the 92 total Sara had at the beginning of the day. Then add the 15 flower arrangements she sold in the morning.

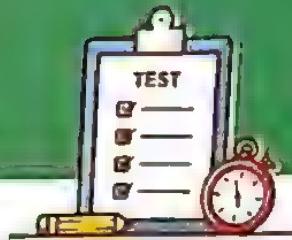
- 2.** A ship entered a port with 611 tonnes of cargo. It picked up a 25 tonnes shipment of fresh fruit and a 149 tonnes shipment of electronics before it left the port. How much cargo did the ship leave port with?

- A. 437 tonnes B. 636 tonnes
C. 760 tonnes D. 785 tonnes

- 4.** Yosra mixes 50 grams of fertilizer with 500 grams of soil. She fills a pot with the mixture and has 130 grams left over at the end. How much mixture went into the pot?

- A. 320 grams B. 370 grams
C. 420 grams D. 680 grams

Concept 2 Assessment | Unit 2



1. put (✓) to the correct answer and (✗) to the incorrect answer.

- a. If $m - 3 = 7$, then $m = 4$ ()
- b. If $13,451 + x = 22,424$, then $x = 8,973$ ()
- c. If $78,000 - m = 42,780$, then $m = 35,220$ ()
- d. Two ant colonies have 7,462 ants, colony A has 4,322 ants, then the number of ants in colony B = 11,784 ()
- e. Bassem had 50 L.E. he bought juice for 5 L.E. and candy for 17 L.E., then the remainder money with him is 28 L.E. ()
- f. If $m + 2,000 = 3,500$, then $m = 5,500$ ()

2. Choose the correct answer.

- a. If $p + 3,562 = 5,562$, then $p =$ _____
 A. 1,000 B. 2,000 C. 9,124 D. 9,220
- b. If $3,200 - x = 1,500$, then $x =$ _____
 A. 1,700 B. 4,700 C. 4,800 D. 5,000
- c. What is the value of x ? $36 + x = 57$
 A. 19 B. 21 C. 83 D. 93
- d. Mariam is reading a book. She reads 56 pages in the first day and 78 pages in the second day. She has 69 pages left to read. How many pages are in the book?
 A. 91 pages B. 65 pages
 C. 203 pages D. 47 pages
- e. A store started the day with 24 jackets. The store had 10 jackets left at the end of the day. Let j represent the number of jackets sold. Which bar model represents how many jackets the store sold? _____
 A.

24	
10	j

 B.

10	
24	j

 C.

j	
24	10

 D.

j	
10	24

24	
10	j

10	
24	j

j	
24	10

j	
10	24

- f. Ahmed bought several kahk cookies. After he ate 4 of them, he had 12 left. Let c represent the number of cookies. Which equation represents how many cookies he bought?

A. $c + 4 = 12$

B. $c + 12 = 4$

C. $c - 4 = 12$

D. $12 - 4 = c$

3. Complete the following.

a. If $m - 12 = 4$, then $m =$

b. In the bar model

37
y
17

, $y =$

c. In the bar model

100
35
x

 the equation which you can form for it is

d. If $152,350 = c + 42,125$, then $c =$

e. In the bar model

x
54
32

, $x =$

f. Anty colony A has 3,425 female ants. If the colony has 8,211 ants, then the number of male ants =

4. Match.

a. $3,648 - x = 3,625$

1. $x = 21$

b. $x + 38 = 62$

2. $x = 22$

c. $x - 8 = 14$

3. $x = 23$

d. $3,254 + x = 3,275$

4. $x = 24$

5. Amgad plans to paint his house. He already has some paint for the project. He buys additional 26 liters of paint before starting the project. After using 19 liters for the project, he has 11 liters left. How much paint did he have before he started the project?

6. Sara adds 145 grams of cornstarch to a bowl and then mixes in 225 grams of flour. She weighs the bowl with the ingredients in it and finds that it weighs 500 grams in total. How much does the bowl weigh?

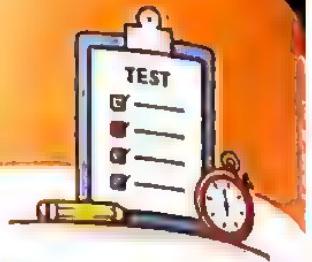
7. The odometer on Zayn's car reads 350 kilometers. After driving to his friend's house, it reads 372 kilometers. He wrote down the equation $350 + x = 372$ where x stands for how far he drove. What is x ?
8. The Suez Canal extends from Port Said to the city of Suez and is 193,120 meters long. If a boat travels 38,620 meters each day for 2 days, how many more meters will it need to travel to reach the end of the canal?
-
9. Tanta has a population of 404,901. If Banha has a population of 167,029 and Kafr ad Dawwar has a population of 267,370, how many more people live in Banha and Kafr ad Dawwar combined than in Tanta?
-
10. Salma was counting ants in colony A. She counted 1,525 ants on Monday, 19,750 ants on Tuesday, and 3,705 ants on Wednesday. If there are 30,520 ants in colony A, how many more ants does she still need to count?

11. In the opposite bar model
- | | |
|---|-----|
| | 15 |
| 7 | x |
- Write four equations representing it.

12. Sandy had L.E. 2,000,000 she bought a car for 235,800 L.E. and a mobile for 2,500 L.E. Find the remainder money with her.



Unit 10: ASSESSMENT



1. Put (✓) to the correct answer and (✗) to the incorrect answer.

- a. The statement $47 - 23 = 23 - 47$ is correct, because the commutative property applies to addition and subtraction.
- b. If $x + 5 = 7$, then $x = 2$
- c. $469 + 252 = 217$
- d. The strategy to find $112 - 69$ mentally is using compensation to subtract $112 - 70$, then add 1
- e. The best rounding to estimate a reasonable answer to the problem $427 + 148$ is $430 + 150 = 580$ so, the answer 580 is reasonable.
- f. Rana had 251,750 pounds, she bought a mobile for 5,555 pounds and a car for 125,780 pounds , then the left money with Rana is 131,335 pounds.

2. Choose the correct answer.

- a. In the bar model

	256
m	180

, the value of m is _____
 A. 124 B. 156 C. 76 D. 436
- b. $(112 + 38) + 77 = 112 + [\quad + 77]$
 A. 38 B. 77 C. 115 D. 150
- c. $1,325 - 820 = \underline{\hspace{2cm}}$
 A. 305 B. 405 C. 505 D. 1,505
- d. $0 + 5,298 = 5,298$ is using _____
 A. associative property B. commutative property
 C. additive identity property D. subtraction mental strategy
- e. If $3,645 + y = 5,789$, then the value of y is _____
 A. 2,144 B. 3,144 C. 8,434 D. 9,434
- f. Joudy found that $38,828 + 52,309 = 91,137$. Which estimate could she use to check if her answer is reasonable ?
 A. $30,000 + 50,000 = 80,000$ B. $30,000 + 60,000 = 90,000$
 C. $40,000 + 50,000 = 90,000$ D. $40,000 + 60,000 = 100,000$

3. Complete the following.

- a. Two ants colonies have 33,585 ants. If colony A has 17,990 ants, then the number of ants in colony B = _____ ants.
- b. To find $120 - 23$ mentally using break apart subtract _____, then subtract _____ to find that $120 - 23$ equals _____.
- c. In the bar model

87
27
c

, the equation which you can form for it is _____ and the value of c equals _____.
- d. If $n - 34 = 29$, then $n =$ _____.
- e. $7,000 - 350 =$ _____.
- f. A local bakery sold 7,120 zalabya in one day. If they sold 1,269 zalabya in the morning and 2,658 zalabya in the afternoon, then the number of zalabya sold during the rest of the day is _____ zalabya.

4. Match.

a. $3,508 + 3,692$

1. $1,000 + 30,000 + 477$

b. $12,968 + 12,932$

2. $2,000 + 900 + 6$

c. $6,592 - 3,686$

3. $9,653 - 2,453$

d. $1,000,000 - 968,523$

4. $35,986 - 10,086$

5. Nader made 18 pieces of falafel. He ate 6 pieces and his brother ate 5 pieces. Represent these data using bar model to show how many pieces are left?

6. Use two different mental math strategies to find the answer of the following.

a. $17 + 15$

b. $266 - 192$

7. Sara had a sandwich with 290 calories for breakfast. Then Sara had a glass of milk, an orange and a chicken sandwich for lunch. The milk had 190 calories, the orange had 85 calories and the chicken sandwich had 355 calories. If the average adult can eat 2,000 calories per day, how many more calories can Sara eat today?

8. A fire ant colony has 235,000 ants. A Gigantiops destructor ant colony has 7,800 ants. What is the difference between the size of the two colonies? Round to the nearest thousand to estimate and check the reasonableness of the answer.

9. The Cairo tower had 66,000 visitors in January, 38,536 visitors in February and 46,985 visitors in March. They expect to have 200,000 visitors by the end of April. How many visitors need to show up in April to reach this count?

10. In the opposite bar model:

Write four equations represent it

	13,280
5,420	x

Find the value of x

11. Use count back or count on using the number line to find $734 - 245$

12. The odometer on Ramy's car reads 275 kilometer. After driving to his friend's house, it reads 293 kilometer. He wrote down the equation $275 + k = 293$ where k stands for how far he drove. What is k?



3

Concepts of Measurement

- » Concept 1 : Metric Measurement
- » Concept 2 : Time and Scaled Measurements
- » Concept 3 : Measurement All Around



Fast Fact

Giraffes' long necks allow them to reach the leaves on treetops. A giraffe is the tallest land mammal. Some giraffes can be as tall as 6 meters !

Concept

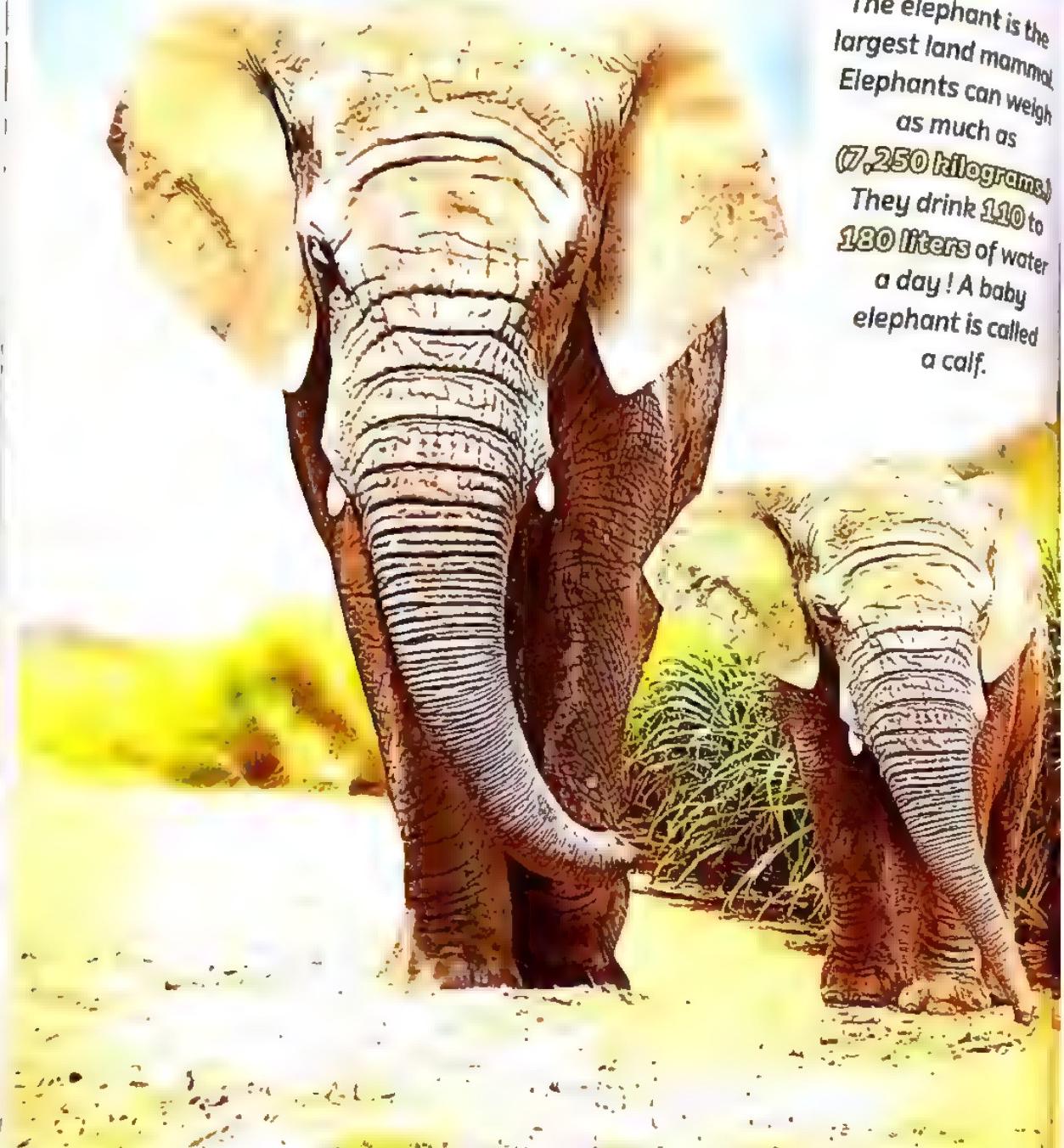
1

Metric Measurement



Fast Fact

The elephant is the largest land mammal. Elephants can weigh as much as 7,250 kilograms! They drink 110 to 180 liters of water a day! A baby elephant is called a calf.



Concept Overview

In concept 1:

Metric Measurement, students review units of length, mass, and capacity and extend their understanding by investigating the relationships between units. Students make connections between the metric conversion chart and the place value chart, including the understanding that, as we move to the left in a place value chart, the value of the digit increases by 10 times. Students also recognize that the same measurement can be represented in multiple ways (for example, 100 centimeters is the same as 1 meter). Lessons 1, 2, and 3 are deliberately similar to help students see patterns in the metric system.

Lesson No.	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 1	3-1 Ant Travel	Centi - Centimeter - Convert - Decompose - Kilo - Kilometer - Length - Meter - Metric System - Milli - Millimeter	<ul style="list-style-type: none">Students will explain the relationship between metric units of length.Students will convert between metric units of length.
Lesson 2	3-2 The Weight Can Wait	Grams - Kilograms - Mass - Weight	<ul style="list-style-type: none">Students will explain the relationship between metric units of mass.Students will convert between metric units of mass.
Lesson 3	3-3 Fill It Up	Capacity - Liter - Milliliter - Volume	<ul style="list-style-type: none">Students will explain the relationship between metric units of capacity.Students will convert between metric units of capacity.
Lesson 4	3-4 Measurement and Unit Conversions	Review vocabulary as needed	<ul style="list-style-type: none">Students will compare place value relationships and measurement conversions.Students will use multiplication and division to convert units of measurement.

3-1 Ant Travel

"Metric Units of Length"

Learn

Meter, centimeter and millimeter are three units of measuring lengths.



A corn kernel is about 10 millimeters long.

An ear of corn is about 20 centimeters long.

A young corn plant is about 1 meter.



Relating units of length

Rasha visited Suez Canal with school trip, and asked her teacher "What's the length of Suez Canal?", the teacher answered "About 193,000 meters, and you can use another unit to the large lengths which is kilometer, so the length is about 193 km"



- In the metric system, the meter (m) is the basic unit of length.
- The metric system also uses prefixes to describe amounts that are larger or smaller than the basic unit. The most common prefixes are kilo-, meaning 1,000. centi-, meaning $\frac{1}{100}$ and milli-, meaning $\frac{1}{1,000}$.

Notes for parents :

- Ask your child to find something at home is about 10 cm in length, and another something is about 1 m

Name	Abbreviation	Number of Base Units	Approximate Comparison
Kilometer	km	1,000	Length of 9 football fields
Meter	m	1	Half the height of a door
Centimeter	cm	$\frac{1}{100}$	Width of your smallest finger
Millimeter	mm	$\frac{1}{1,000}$	Thickness of a dime

- In this lesson, you will study the relationship between "km, m , cm, mm", and you are going to study other metric units of length at the last lesson of this concept.

Converting metric length units

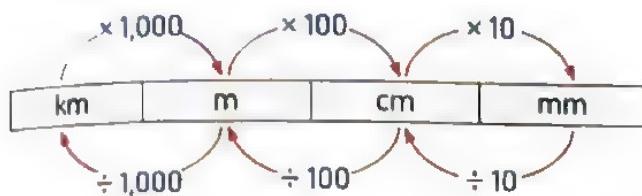


Table of Measures

1 kilometer = 1,000 meters

1 meter = 100 centimeters

1 centimeters = 10 millimeters

- The tables below helps you convert from length unit to another.

km	1	2	3	4	5	6
m	1,000	2,000	3,000	4,000	5,000	6,000
m	1	2	3	4	5	6
cm	100	200	300	400	500	600
cm	1	2	3	4	5	6
mm	10	20	30	40	50	60

Example 1

Fill in blanks.

a. $8\text{ m} = \underline{\hspace{2cm}}\text{ cm}$

b. $700\text{ cm} = \underline{\hspace{2cm}}\text{ m}$

c. $130\text{ mm} = \underline{\hspace{2cm}}\text{ cm}$

d. $15,000\text{ m} = \underline{\hspace{2cm}}\text{ km}$

e. $5\text{ km} = \underline{\hspace{2cm}}\text{ cm}$

*After this concept, your child will understand that when moving from a length unit to another he/she can multiply by 10, 100, 1,000.

Solution

- a. $8\text{ m} = 800\text{ cm}$ [Think: $1\text{ m} = 100\text{ cm}$]
 c. $130\text{ mm} = 13\text{ cm}$ [Think: $10\text{ mm} = 1\text{ cm}$]
 e. $5\text{ km} = 5,000\text{ m}$ [Think: $1\text{ km} = 1,000\text{ m}$]
 $= 500,000\text{ cm}$ [Think: $1\text{ m} = 100\text{ cm}$]

- b. $700\text{ cm} = 7\text{ m}$ [Think: $100\text{ cm} = 1\text{ m}$]
 d. $15,000\text{ m} = 15\text{ km}$ [Think: $1,000\text{ m} = 1\text{ km}$]

Example 2

Complete each of the following

a. $7\text{ m}, 56\text{ cm} = \text{ } \text{cm}$
 c. $12\text{ km}, 12\text{ m} = \text{ } \text{m}$

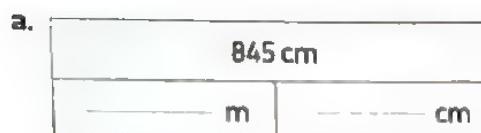
b. $9\text{ cm}, 5\text{ mm} = \text{ } \text{mm}$

Solution

- a. $7\text{ m}, 56\text{ cm} = 700\text{ cm} + 56\text{ cm} = 756\text{ cm}$
 b. $9\text{ cm}, 5\text{ mm} = 90\text{ mm} + 5\text{ mm} = 95\text{ mm}$
 c. $12\text{ km}, 12\text{ m} = 12000\text{ m} + 12\text{ m} = 12,012\text{ m}$

Example 3

Convert the lengths into the units on the bar models.

**Solution**(Think: $845 = 800 + 45$)(Think: $29,603 = 29,000 + 603$)**Check your understanding**Compare, write ($>$, $<$ or $=$) for each circle.

- a. $8\text{ m} \bigcirc 400\text{ cm}$
 c. $2,000\text{ cm} \bigcirc 2\text{ m}$

- b. $9,000\text{ m} \bigcirc 9\text{ km}$
 d. $600\text{ mm} \bigcirc 70\text{ cm}$

Notes for parents :

Let your child explain the relationships between the metric length units "km, m, cm, mm".

Exercise 13

3-1 Ant Travel "Metric Units of Length"

REMEMBER

MATH PLANO

DATA

PROBLEM SOLVING

1.1 From the school book

1. 1. a. Circle the best unit to measure each length.

1. Height of a student

Kilometer

Meter

Centimeter

Millimeter

2. Distance between home and school

Kilometer

Meter

Centimeter

Millimeter

3. Length of the Nile River

Kilometer

Meter

Centimeter

Millimeter

4. Length of an ant

Kilometer

Meter

Centimeter

Millimeter

5. Distance from Cairo to Alexandria

Kilometer

Meter

Centimeter

Millimeter

1. b. Fill in the blanks to answer the following questions. Think of things that could be measured in each unit.

- _____ is best measured in kilometers because _____
- _____ is best measured in meters because _____
- _____ is best measured in centimeters because _____
- _____ is best measured in millimeters because _____

2. Complete.

a. 1 km = _____ m

b. 4 km = _____ m

c. 100 mm = _____ cm

d. 1 m = _____ cm

e. 20 m = _____ cm

f. 30 cm = _____ mm

g. 4,000 cm = _____ mm

h. 50,000 m = _____ km

i. _____ m = 70 km

j. _____ cm = 3,900 m

k. 6 m = _____ mm

l. 8 km = _____ cm

3. Find the missing numbers.

a.

230 cm	
m	— cm

b.

478 cm	
— m	— cm

c.

678 cm	
— m	— cm

d.

— m	
7 km	6 m

e.

— m	
8 km	88 m

f.

— mm	
7 cm	5 mm

g. $5,744 \text{ m} = \underline{\hspace{2cm}} \text{ km}, \underline{\hspace{2cm}} \text{ m}$

h. $98 \text{ mm} = \underline{\hspace{2cm}} \text{ cm}, \underline{\hspace{2cm}} \text{ mm}$

i. $3,576 \text{ cm} = \underline{\hspace{2cm}} \text{ m}, \underline{\hspace{2cm}} \text{ cm}$

j. $\underline{\hspace{2cm}} \text{ cm} = 5 \text{ m}, 91 \text{ cm}$

l. $8 \text{ km}, 14 \text{ m} = \underline{\hspace{2cm}} \text{ m}$

n. $27 \text{ km}, 55 \text{ m} = \underline{\hspace{2cm}} \text{ m}$

k. $4 \text{ m}, 18 \text{ cm} = \underline{\hspace{2cm}} \text{ cm}$

m. $18 \text{ m}, 14 \text{ cm} = \underline{\hspace{2cm}} \text{ cm}$

4. Put (✓) for the correct statement or (✗) for the incorrect one.

a. $4 \text{ km} = 400 \text{ m}$

[]

b. $55 \text{ m} = 5 \text{ m}, 5 \text{ cm}$

[]

c. $6 \text{ km} = 6,000 \text{ cm}$

[]

d. $70 \text{ m} = 7,000 \text{ cm}$

[]

e. $6 \text{ km}, 6 \text{ m} = 12 \text{ m}$.

[]

f. $8,000 \text{ mm} = 8 \text{ m}$

[]

5. Answer each one of the following.



- a. The driveway in front of a brown house is 65 meters long and the driveway in front of a red house is 5,900 centimeters long, which house has a longer driveway?
-
-
-

- b. A train covers 3 km in one minute, what is the distance the train covers in 7 minutes in kilometers and in meters?
-
-
-

c. When scientists studied the anthill, they found that it was 8 meters deep.

1. How many centimeters would that be? Show your work.

2. The colony had to move tons of soil to construct their nest. The worker ants had to carry loads of soil 1 kilometer to the surface. If one ant carried 10 loads of soil in a week, How many kilometers did it travel while moving soil? How many meters? How many centimeters?

km

m

cm

d. Carpenter ants are so named because they build their nests inside wood, they do not eat this wood. Instead, they create a smooth tunnel system through it for their colony. Carpenter ants can be up to 3 centimeters long. A mature colony can have up to 100,000 ants. If the ants lined up end to end and each ant is 1 centimeter long, How many meters long would a line of 100,000 ants be?

e. Using the information from the first item,

How many kilometers long would the line of 100,000 ants be?

f. If one black ant can walk 250 meters in 1 hour, how many hours will it take to walk 1 kilometer?

If the same black ant walked for 10 hours, how far would it go? Express your answer in kilometers and meters.

Multiple Choice Questions

Choose the correct answer.

1. $18 \text{ m}, 14 \text{ cm} = \text{ } \text{ cm}$

- A. 32
- B. 1,814
- C. 18,140
- D. 18,014

2. $3 \text{ km} = \text{ } \text{ m}$

- A. 30
- B. 300
- C. 3,000
- D. 13,000

3. $5,000 \text{ mm} = \text{ } \text{ m}$

- A. 5
- B. 50
- C. 500
- D. 50,000

4. $505 \text{ cm} = \text{ } \text{ m, } \text{ cm}$

- A. 5, 5
- B. 5, , 50
- C. 50, , 5
- D. 50, , 50

5. $\text{ } \text{ m} = 8,400 \text{ cm}$

- A. 84
- B. 840
- C. 8,400
- D. 84,000

6. Anwar measures a stick that is 23 centimeters long. Then, he writes the length of the stick

- in millimeters. What is the place value of the number 2 in the number that Anwar wrote?
- A. Tens
- B. Hundreds
- C. Thousands
- D. Ten Thousands

7. Which sentence best explains the relationship between a meter and a centimeter?

- A. A meter is equal to 100 centimeters.
- B. A meter is equal to 10 centimeters.
- C. A centimeter is equal to 100 meters.
- D. A centimeter is equal to 10 meters.

8. Which sentence about 7 meters is correct?

- A. A meter is 100 times the length of a centimeter. There are 700 centimeters in 7 meters.
- B. A meter is 10 times the length of a centimeter. There are 70 centimeters in 7 meters.
- C. A meter is a larger unit of measurement than a centimeter. There are 7 meters in 7,000 centimeters.
- D. A meter is a smaller unit of measurement than a millimeter. There are 700 millimeters in 7 meters.

9. Amani's class is learning about measuring units of length. At the end of the lesson, each

- student wrote a statement explaining how lengths are related. Which two student statements are correct?
- A. A meter is 10 times as long as 1 millimeter.
- B. A meter is 100 times as long as 1 centimeter.
- C. A meter is 1,000 times as long as 1 kilometer.
- D. A kilometer is 1,000 times as long as 1 meter.
- E. A kilometer is a 1,000 times as long as 1 millimeter.

10. Baahir walked for 4 kilometers. Which two distances also describe how far Baahir walked?

- A. 40 decimeters
- B. 400 millimeters
- C. 4,000 meters
- D. 400,000 millimeters
- E. 400,000 centimeters

3-2 The Weight Can Wait

"Metric Units of Mass"

Learn

Matter is what all objects are made of. Mass is the amount of matter in an object. Metric units of mass are the gram (g) and the kilogram (kg).



The mass of a small paperclip is about 1g



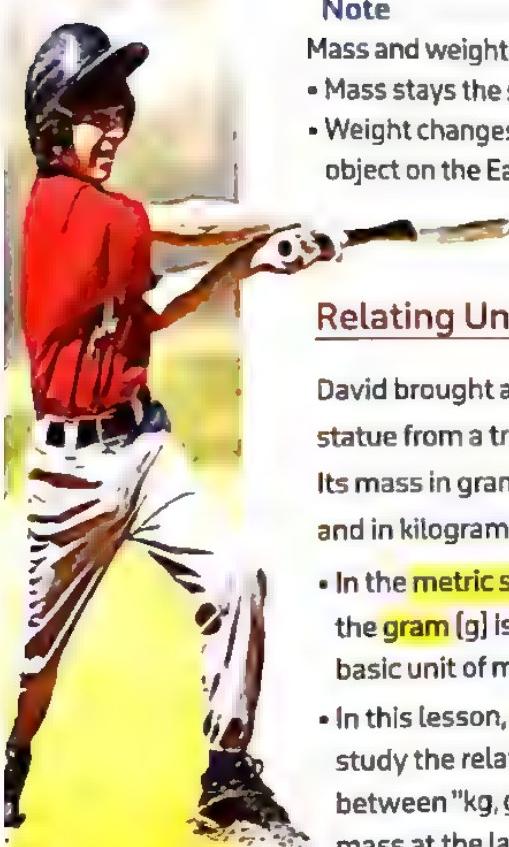
1 kg
1,000 g = 1 kg

The mass of a baseball bat is about 1kg

Note

Mass and weight are different.

- Mass stays the same no matter where you are.
- Weight changes from a place to another, for example the weight of any object on the Earth is different from its weight on the moon.



Relating Units of Mass

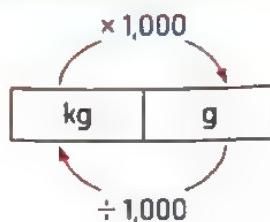
David brought a souvenir statue from a trip to Sinai. Its mass in grams is 2,000 and in kilograms is 2.

- In the metric system, the gram (g) is the basic unit of mass.
- In this lesson, you will study the relationship between "kg, g", and you are going to study other metric units of mass at the last lesson of this concept.



Notes for parents :

- Ask your child to find something at home of mass 20 g , and another something of mass 1 kg

Converting Metric Mass Units

1 kilogram = 1,000 grams



- The table below helps you to convert from mass unit to another.

kg	1	2	3	4	5	6
g	1,000	2,000	3,000	4,000	5,000	6,000

Example 1

Find each missing number.

a. 9 kilograms = _____ grams.

b. 32,000 grams = _____ kilograms

Solution

a. 9 kilograms = 9,000 grams

(Think : 1 kg = 1,000 g)

b. 32,000 grams = 32 kilograms

(Think : 1,000 g = 1 kg)

Example 2

Complete each of the following.

a. 4 kg , 63 g = _____ g

b. 18 kg , 81 g = _____ g

Solution

a. 4 kg , 63 g = 4,000 g + 63 g = 4,063 g

b. 18 kg , 81 g = 18,000 g + 81 g = 18,081 g

Notes for parents :

- Later in this concept, your child will understand that when moving from a mass unit to another he/she can multiply by 10 , 100 , 1,000 ,

Example 3

Convert the masses into the units on the bar models.

1,560 g	
kg	g

27,027 g	
kg	g

Solution 

1,560 g	
1kg	560 g

(Think : $1,560 = 1,000 + 560$)

27,027 g	
27 kg	27 g

(Think : $27,027 = 27,000 + 27$)

Example 4

An Oat bag of mass 250 g, Dalia bought 6 bags, what is the total mass of bags in kilograms and grams?

Solution 

$$\begin{aligned}
 \text{The total mass} &= [250 + 250] + [250 + 250] + [250 + 250] \\
 &= [500 + 500] + 500 \\
 &= \underline{1,000} + 500 = 1\text{ kg}, 500\text{ g} \\
 &\quad \downarrow \\
 &\quad 1\text{ kg}
 \end{aligned}$$

Check your understanding

What is the order of the following masses from least to greatest?

6 kg , 4,769 g , 980 kg , 68,000 g

* Let your child explain the relationship between the metric mass units "kg , g".

Exercise 14

3-2 The Weight Can Wait "Metric Units of Mass"

REMEMBER

PROBLEM SOLVING

From the school book

- 1.** Complete. Tell whether you multiply or divide.

a. $1\text{ kg} = \underline{\hspace{2cm}}\text{ g}$

b. $\square 3\text{ kg} = \underline{\hspace{2cm}}\text{ g}$

c. $\square \text{ kg} = 5,000\text{ g}$

d. $\square 8\text{ kg} = \underline{\hspace{2cm}}\text{ g}$

e. $7,000\text{ g} = \underline{\hspace{2cm}}\text{ kg}$

f. $16,000\text{ g} = \underline{\hspace{2cm}}\text{ kg}$

g. $\square \text{ kg} = 30,000\text{ g}$

h. $\underline{\hspace{2cm}}\text{ kg} = 9,000\text{ g}$

i. $37,000\text{ g} = \underline{\hspace{2cm}}\text{ kg}$

j. $90,000\text{ g} = \underline{\hspace{2cm}}\text{ kg}$

k. $\square 4\text{ kg} = \underline{\hspace{2cm}}\text{ g}$

l. $\underline{\hspace{2cm}}\text{ kg} = 60,000\text{ gm}$

- 2.** Find each missing number.

a. \square

4,590 g	
— kg	— g

b. \square

8,400 g	
— kg	— g

c.

— g	
10 kg	250 g

d.

— g	
15 kg	15 g

e. $7\text{ kg}, 414\text{ g} = \underline{\hspace{2cm}}, \underline{\hspace{2cm}}\text{ g}$

f. $1\text{ kg}, 10\text{ g} = \underline{\hspace{2cm}}, \underline{\hspace{2cm}}$

g. $6,800\text{ g} = \underline{\hspace{2cm}}\text{ kg}, \underline{\hspace{2cm}}\text{ g}$

h. $\square 2,456\text{ g} = \underline{\hspace{2cm}}\text{ kg}, \underline{\hspace{2cm}}\text{ g}$

i. $7\text{ kg}, 7\text{ g} = \underline{\hspace{2cm}}\text{ kg}, \underline{\hspace{2cm}}\text{ g}$

j. $7,760\text{ g} = \underline{\hspace{2cm}}\text{ kg}, \underline{\hspace{2cm}}\text{ g}$

k. $16,403\text{ g} = \underline{\hspace{2cm}}\text{ kg}, \underline{\hspace{2cm}}\text{ g}$

l. $\square 4,535\text{ g} = \underline{\hspace{2cm}}\text{ kg}, \underline{\hspace{2cm}}\text{ g}$

m. $\square 5,235\text{ g} = \underline{\hspace{2cm}}\text{ kg}, \underline{\hspace{2cm}}\text{ g}$

n. $\square 7,324\text{ g} = \underline{\hspace{2cm}}\text{ kg}, \underline{\hspace{2cm}}$

- 3.** Compare. Write ($>$, $<$ or $=$).

a. $95\text{ kg} \quad \bigcirc \quad 950\text{ g}$

b. $3\text{ kg} \quad \bigcirc \quad 30,000\text{ g}$

c. $400\text{ g} \quad \bigcirc \quad 400\text{ kg}$

d. $2\text{ kg} \quad \bigcirc \quad 2,000\text{ g}$

e. $6\text{ kg}, 6\text{ g} \quad \bigcirc \quad 660\text{ g}$

f. $2\text{ kg}, 530\text{ g} \quad \bigcirc \quad 24,000\text{ g}$

4. A colony of black ants is estimated to weigh 3,493 grams.
Rewrite that number using kilograms and grams.

5. A different ant colony is estimated to weigh 14 kilograms and 89 grams.
Rewrite that weight in grams.

6. The table shows the total weight of food harvested by a colony's army ants over 7 days. Use the table to answer the question.
- How much food did the workers harvest in their lifespan?

Day	Weight of food harvested
1	45 grams
2	60 grams
3	50 grams
4	35 grams
5	40 grams
6	55 grams
7	60 grams

7. Use the picture.

- a. What is the order of the sports balls from greatest mass to least mass?

- b. A baseball has a mass of about 145 grams.

Mariam has 2 basketballs and 2 baseballs in her gym bag.

Is the mass of the balls in her bag more or less than 2 kg? Explain.



Multiple Choice Questions

Choose the correct answer.

1. The suitable mass of a rabbit is

- A. 2,000 g
- B. 200 kg
- C. 20 g
- D. 2 g

2. $9 \text{ kg} = \text{ } \text{---} \text{ g}$

- A. 90
- B. 900
- C. 9,000
- D. 90,000

3. $5 \text{ kg}, 5 \text{ g} = \text{ } \text{---} \text{ g}$

- A. 10
- B. 505
- C. 5
- D. 5,005

4. Which of the following is the greatest mass?

- A. 900 g
- B. 20,000 g
- C. 70 kg
- D. 16 kg

5. $5,400 \text{ g} = \text{ } \text{---} \text{ kg}, \text{ } \text{---} \text{ g}$

- A. 5,4
- B. 5,40
- C. 5,400
- D. 50,40

6. $4,000 \text{ g} = \text{ } \text{---} \text{ kg}$

- A. 4
- B. 40
- C. 400
- D. 40,000

7. $8,600 \text{ g} \text{ } \text{---} \text{ kg}$

- A. >
- B. <
- C. =

8. A fizzy can of mass 300 g, Ahmed bought 4 cans. What is the total mass of cans in kilograms and grams?

- A. 700 gm
- B. 1 kg, 3 g
- C. 1 kg, 200 g
- D. 1 kg, 300 g

9. A class is investigating how units of mass are related. Afterward, the students write a statement to explain their findings. Which statement is correct?

- A. A gram is equal to 1,000 kilograms.
- B. A kilogram is equal to 1,000 grams.
- C. A kilogram is equal to 100 grams.
- D. A gram is equal to 10,000 kilograms.

10. Ahmed used a scale weighing in both kilograms and grams. As Ahmed weighed different objects, which two conclusions could he have made?

- A. Two kilograms are equivalent to 2,000 grams.
- B. Two hundred kilograms are equivalent to 20,000 grams.
- C. Twenty kilograms are equivalent to 20,000 grams.
- D. Twenty kilograms are equivalent to 2,000 grams.
- E. Two hundred kilograms are equivalent to 2,000,000 grams.

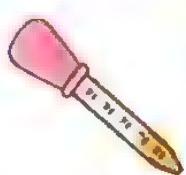
3-3 Fill It Up

"Metric Units of Capacity"

Learn

Capacity is the amount of liquid a container can hold.

- A Milliliter [mL] and a liter [L] are metric units that measure capacity.



$$1\text{ L} = 1,000 \text{ mL}$$



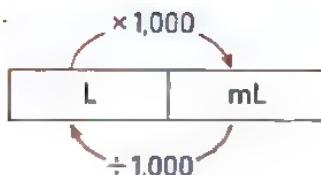
A milliliter is about 20 drops from an eyedropper.

The water bottle holds 1 liter [L] of water.

Relating Units of Capacity

- In the metric system, the liter [L] is the basic unit of capacity.
- In this lesson, you will study the relationship between "L, mL", and you are going to study other metric units of capacity at the last lesson of this concept.

Converting Metric Capacity Units



$$1\text{ Liter} = 1,000 \text{ milliliters}$$

- The table below helps you convert from capacity unit to another.

L	1	2	3	4	5	6
mL	1,000	2,000	3,000	4,000	5,000	6,000

Notes for parents :

- Ask your child to bring 2 containers that might hold about 1 liter at home.

Example 1

Find each missing number.

a. 8 Litres = _____ Milliliters.

b. 56,000 mL = _____ L

Solution 

a. 8 Liters = 8,000 milliliters

(Think : 1 Liter = 1,000 milliliters)

b. 56,000 mL = 56 L

(Think : 1,000 mL = 1 L)

Example 2

Find the missing number.

47,665 mL	
L	mL

b. 13 L , 13 mL = _____ mL

Solution 

47,665 mL	
47 L	665 mL

(Think : $47,665 = 47,000 + 665$)

b. $13 \text{ L} , 13 \text{ mL} = 13,000 \text{ mL} + 13 \text{ mL} = 13,013$

Example 3

Calculate.

a. $4 \text{ L} + 3,778 \text{ mL} = \text{_____ L, } \text{_____ mL}$

b. $2 \text{ L} , 340 \text{ mL} + 900 \text{ mL} = \text{_____ L, } \text{_____ mL}$

c. $5 \text{ L} - 2,570 \text{ mL} = \text{_____ L, } \text{_____ mL}$

d. $24 \text{ L} , 800 \text{ mL} - 19 \text{ L} , 510 \text{ mL} = \text{_____ L, } \text{_____ mL}$

Solution 

a. $3,778 \text{ mL} = 3 \text{ L}, 778 \text{ mL}$

$4 \text{ L} + 3 \text{ L}, 778 \text{ mL} = 7 \text{ L}, 778 \text{ mL}$

Notes for parents :

- Later in this concept, your child will understand that when moving from a capacity unit to another he/she can multiply by 10, 100, 1,000,

$$\begin{aligned}
 b. 2\text{L}, 340\text{ mL} + 900\text{ mL} &= 2\text{L} + (340 + 900)\text{ mL} \\
 &= 2\text{L} + 1,240\text{ mL} = 2\text{L} + [(1,000) + 240]\text{ mL} \\
 &\quad \downarrow \\
 &= 3\text{L}, 240\text{ mL}
 \end{aligned}$$

$$\begin{aligned}
 c. 5\text{L} &= 5 \times 1,000 = 5,000\text{ mL} \\
 5,000\text{ mL} - 2,570\text{ mL} &= [5,000 - 2,570]\text{ mL} \\
 &= 2,430\text{ mL} = [(2,000) + 430]\text{ mL} = 2\text{L}, 430\text{ mL} \\
 &\quad \downarrow \\
 &= 2\text{L}
 \end{aligned}$$

$$\begin{aligned}
 d. (24\text{ L}) (800\text{ mL}) - (19\text{ L}) (510\text{ mL}) \\
 &= (24 - 19)\text{ L}, (800 - 510)\text{ mL} \\
 &= 5\text{L}, 290\text{ mL}
 \end{aligned}$$

Example 4

A truck consumed 1L, 560 mL of gas in the first hour and 1L, 840 mL in the second hour. Write the amount of gas consumed by the truck in liters and milliliters in the two hours.

Solution

$$\begin{aligned}
 \text{The amount} &= (1\text{L}, 560\text{ mL}) + (1\text{L}, 840\text{ mL}) \\
 &= (1+1)\text{L} + (560 + 840)\text{ mL} \\
 &= 2\text{L} + 1,400\text{ mL} \\
 &= 2\text{L} + [(1,000) + 400]\text{ mL} \\
 &\quad \downarrow \\
 &= 3\text{L}, 400\text{ mL}
 \end{aligned}$$

Another Solution :

$$\begin{aligned}
 1\text{L}, 560\text{ mL} &= 1,000\text{ mL} + 560\text{ mL} = 1,560\text{ mL} \\
 1\text{L}, 840\text{ mL} &= 1,000\text{ mL} + 840\text{ mL} = 1,840\text{ mL} \\
 \text{The amount} &= 1,560\text{ mL} + 1,840\text{ mL} \\
 &= 3,400\text{ mL} \\
 &= [(3,000) + 400]\text{ mL} = 3\text{L}, 400\text{ mL} \\
 &\quad \downarrow \\
 &= 3\text{L}
 \end{aligned}$$

Check your understanding

Which number of units is greater, the capacity of a container given in liters or milliliters ? Explain.

Your child explain the relation between the metric capacity units " L , mL".

Exercise

15

3-3 Fill It Up

"Metric Units Of Capacity"

REMEMBER

APPLY

PROBLEM SOLVING

From the school book

1. Complete.

- a. 6 L = _____ mL
 c. 19 L = _____ mL
 e. 50 L = _____ mL
 g. 29,000 mL = _____ L
 i. _____ mL = 73 L

- b. 3 L = _____ mL
 d. 25 L = _____ mL
 f. 4,000 mL = _____ L
 h. _____ L = 10,000 mL
 j. _____ L = 560,000 mL

2. Find each missing number.



<input type="text"/>	6,360 mL	
— L	— mL	

<input type="text"/>	mL	
9 L	900 mL	

- e. 8 L, 500 mL = _____ mL
 g. 84 L, 84 mL = _____ mL
 i. 6 L, 6 mL = _____ mL
 k. _____ mL = 61 L, 254 mL
 m. _____ L, _____ mL = 541,541 mL
 o. _____ mL = 7 L, 400 mL

<input type="text"/>	9,425 mL	
— L	— mL	

<input type="text"/>	mL	
25 L	25 mL	

- f. 19 L, 324 mL = _____ mL
 h. 5,700 mL = _____ L, _____ mL
 j. 2,222 mL = _____ L, _____ mL
 l. 9,090 mL = _____ L, _____ mL
 n. 4 L, 234 mL = _____ mL
 p. _____ mL = 8 L, 910 mL

3. Fill in blanks.



- a. 5 L + 6,000 mL = _____ mL
 c. 8 L - 2,000 mL = _____ L
 e. 1 L, 500 mL + 3 L, 200 mL = _____ mL
 f. 23 L, 244 mL + 2 L, 50 mL = _____ mL
 g. 13 L, 200 mL - 3 L, 100 mL = _____ mL
 h. 4 L, 540 mL - 4 L, 95 mL = _____ mL i. 4 L, 375 mL + 5 L, 625 mL = _____ L

4. List 6 L, 4,000 mL, 13,000 mL, 5 L from least to greatest.

5. Answer each of the following.

a. A car is filled with 45 liters of petrol. How many milliliters would that be?

b. A family drank 1 liter, 500 milliliters of orange juice at breakfast. If there were 3 liters of orange juice before breakfast, how much orange juice is left?

c. Mostafa drinks 200 mL of milk daily, what is the amount of milk he drinks in liter for 10 days?

d. Doha's fish tank contains 5 liters, 245 milliliters of water. If the tank can hold 10 liters of water, how much more water does she need to fill the tank?

e. A car was filled with 20 liters, 500 milliliters of petrol. At the end of the day, there were 15 liters, 250 milliliters left in the tank. How much petrol was used?

f. Use the recipe that follows to answer the questions.

Sobia Ingredients :

- | | | |
|------------------------------|----------------|-----------------------|
| • 100 g raw short grain rice | • 500 mL water | • 750 mL cold milk |
| • 100 g caster sugar | • 5 mL vanilla | • 500 mL coconut milk |

1. Which ingredients are measured by mass?

2. Which ingredients are measured by capacity?

3. What is the total amount of liquid ingredients in the drink in milliliters? In liters?



Choose the correct answer.

1. The suitable capacity is

- A. 5 mL
- B. 300 mL
- C. 5 L
- D. 300 L



3. $6\text{ L} + 4,000 \text{ mL} =$ L

- A. 10
- B. 46
- C. 64
- D. 640

5. $29,907 \text{ mL} =$ L, mL

- A. 29.97
- B. 29.970
- C. 2.907
- D. 29.907

7. A water jug holds 8 liters. How many milliliters does it hold?

- A. 80
- B. 800
- C. 8,000
- D. 80,0000

9. Fatima poured liquid into a beaker labeled with both liters and milliliters. Which observation could Fatima have made?

- A. There are 10 millilitres in 1 litre.
- B. There are 100 millilitres in 1 litre.
- C. There are 1,000 millilitres in 1 litre.
- D. There are 10,000 millilitres in 1 litre

2. $81,277 \text{ mL} =$ mL

- A. 8,270
- B. 82,700
- C. 8,027
- D. 8,207

4. $7\text{ L}, 900 \text{ mL} - 4\text{ L}, 400 \text{ mL} =$ L, mL

- A. 3,400
- B. 2,500
- C. 2,400
- D. 3,500

6. Ahmed drunk 200 mL of apple juice from an apple juice bottle of 1 liter, what is the amount of left juice?

- A. 100 mL
- B. 300 mL
- C. 800 mL
- D. 1,200 mL

8. Zahra poured 2 liters of milk into a mixing bowl. How many milliliters of milk did she pour?

- A. 20
- B. 200
- C. 2,000
- D. 20,000

10. A company sells laundry soap to businesses

In containers of the following sizes.

Container A: 3,000 liter

Container B: 3,000 milliliters

Container C: 300 liters

Which list shows the containers from least to greatest capacity?

- A. Container A, Container B, Container C
- B. Container A, Container C, Container B
- C. Container C, Container B, Container A
- D. Container B, Container C, Container A

3-4 Measurement and Unit Conversions

Learn

How do you change from one metric unit of measure to another?

Problem

In a training for a marathon, Maged ran a distance of 5 kilometres.
How many meters did he run?

$$\text{Think : } 5 \text{ km} = \text{ m}$$

A kilometer is a larger unit than a meter.

When you change large units to smaller units, you need more of the smaller units, so multiply by 10, 100 or 1,000

The distance in kilometers	\times	meters in 1 kilometer	=	The distance in meters
5	\times	1,000	=	5,000

So, Maged ran 5,000 meters.

When you change smaller units to larger unit, you need fewer of the large units, so divide by 10, 100 or 1,000

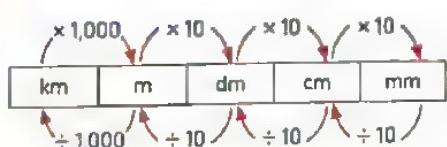
For example : 300 millimeters = centimeters Since a millimeter is a smaller unit than a centimeter, divide.

millimeters	\div	millimeters in 1 centimeter	=	centimeters
300	\div	10	=	30

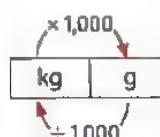
So, 300 millimeters = 30 centimeters.

Remember

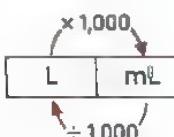
Converting metric length units



Converting metric mass units



Converting metric capacity units



Notes for parents :

- Ask your child to rewrite 2 liters in milliliters.

Example 1

Fill in the blanks.

a. $6\text{ m} = \underline{\hspace{1cm}}\text{ dm}$ b. $80\text{ kg} = \underline{\hspace{1cm}}\text{ g}$ c. $2,000\text{ mL} = \underline{\hspace{1cm}}\text{ L}$

Solution

a. $6\text{ m} = 6 \times 10 = 60\text{ dm}$
 b. $80\text{ kg} = 80 \times 1,000 = 80,000\text{ g}$
 c. $2,000\text{ mL} = 2,000 \div 1,000 = 2\text{ L}$

Enrich your knowledge

- Changing units in the metric system is like moving from one place-value position to another.

	$\times 10$	$\times 10$	$\times 10$	$\times 10$	$\times 10$	$\times 10$	
kilo-thousands							milli-
hecta-hundreds							
deca-tens							
base-ones							
Units of length	Kilometer km	Hectometer hm	Decameter dam	Meter m	Decimeter dm	Centimeter cm	Millimeter mm
Units of mass	Kilogram kg	Hectogram hg	Decagram dag	Gram g	Decigram dg	centigram cg	Milligram mg
Units of capacity	Kiloliter kL	Hectoliter hL	Decaliter dal	Liter L	Deciliter dL	centiliter cL	Milliliter mL

$\downarrow 10$ $\downarrow 10$ $\downarrow 10$ $\downarrow 10$ $\downarrow 10$ $\downarrow 10$ $\downarrow 10$

Example 2

Complete.

a. $4\text{ hectograms} = \underline{\hspace{1cm}}$ decagrams. b. $6,000\text{ mL} = \underline{\hspace{1cm}}$ dL

Solution

- a. To change hectogram to decagram, move one place to the right, so multiply by 10.

$4\text{ hectograms} = 4 \times 10 = 40\text{ decagrams.}$

- b. To change milliliter to deciliter, move two places to the left, so divide by 100.

$6,000\text{ mL} = 6,000 \div 100 = 60\text{ dL}$



your understanding

Fill in the blanks.

a. $7,000\text{ mL} = \underline{\hspace{1cm}}$ L	b. $500\text{ cm} = \underline{\hspace{1cm}}$ m	c. $18\text{ kg} = \underline{\hspace{1cm}}$ g
d. $8\text{ km} = \underline{\hspace{1cm}}$ dm	e. $2\text{ L} = \underline{\hspace{1cm}}$ cL	f. $4,000\text{ g} = \underline{\hspace{1cm}}$ dg

• To change larger units to smaller units, multiply by 10 for each place you move to the right.

• To change smaller units to larger units, divide by 10 for each place you move to the left.

Exercise 16

3-4 Measurement and Unit Conversions

REMEMBER

KNOW

PROBLEM SOLVING

From the school book

1. Choose the smaller unit to measure.

- | | | |
|-------------|------------|------------|
| a. dm or mm | b. L or dL | c. mg or g |
| d. km or m | e. kg or g | f. cL or L |

2. Choose the greater unit to measure.

- | | | |
|-------------|-------------|------------|
| a. mL or L | b. g or mg | c. m or dm |
| d. hg or kg | e. cm or dm | f. kL or L |

3. Complete. Tell whether you multiply or divide.

- | | |
|---|--|
| a. $35 \text{ kg} = \underline{\hspace{2cm}} \text{ g}$ | b. $\square 70 \text{ km} = \underline{\hspace{2cm}} \text{ hm}$ |
| c. $8 \text{ kL} = \underline{\hspace{2cm}} \text{ L}$ | d. $5 \text{ hg} = \underline{\hspace{2cm}} \text{ g}$ |
| e. $\square 6,000 \text{ mL} = \underline{\hspace{2cm}} \text{ dL}$ | f. $100 \text{ dm} = \underline{\hspace{2cm}} \text{ m}$ |
| g. $2,300 \text{ L} = \underline{\hspace{2cm}} \text{ hL}$ | h. $\square 40 \text{ g} = \underline{\hspace{2cm}} \text{ dag}$ |
| i. $17 \text{ cg} = \underline{\hspace{2cm}} \text{ mg}$ | j. $9,000 \text{ mL} = \underline{\hspace{2cm}} \text{ L}$ |
| k. $7 \text{ km} = \underline{\hspace{2cm}} \text{ dm}$ | |
| l. 200 centimeters is equivalent to $\underline{\hspace{2cm}}$ meters or $\underline{\hspace{2cm}}$ decimeters. | |
| m. $4,000 \text{ grams}$ is equivalent to $\underline{\hspace{2cm}}$ decagrams or $\underline{\hspace{2cm}}$ hectograms. | |
| n. 2 liters is equivalent to $\underline{\hspace{2cm}}$ centiliters or $\underline{\hspace{2cm}}$ milliliters. | |
| o. $\underline{\hspace{2cm}} \text{ kg} = 8,000 \text{ g} = \underline{\hspace{2cm}} \text{ dg}$ | |

4. Write with the correct unit.

- | | |
|---|---|
| a. $20 \text{ dm} = 200 \underline{\hspace{2cm}}$ | b. $40 \text{ g} = 400 \underline{\hspace{2cm}}$ |
| c. $6 \underline{\hspace{2cm}} = 60 \text{ dm}$ | d. $14 \text{ L} = 14,000 \underline{\hspace{2cm}}$ |
| e. $5,000 \underline{\hspace{2cm}} = 50 \text{ kg}$ | f. $8 \underline{\hspace{2cm}} = 80,000 \text{ mL}$ |
| g. $70 \underline{\hspace{2cm}} = 70,000 \text{ g}$ | h. $3 \underline{\hspace{2cm}} = 30,000 \text{ dm}$ |

5. Compare. Write ($>$, $<$ or $=$) for each \bigcirc

- | | |
|--|---|
| a. $8 \text{ m} \bigcirc 400 \text{ mm}$ | b. $40 \text{ mg} \bigcirc 10 \text{ g}$ |
| c. $900 \text{ L} \bigcirc 9 \text{ kL}$ | d. $2,000 \text{ cm} \bigcirc 20 \text{ m}$ |
| e. $10 \text{ dm} \bigcirc 1,000 \text{ mm}$ | f. $1 \text{ kg} \bigcirc 500 \text{ g}$ |

6. Complete.

a. $4 \text{ km}, 7 \text{ m} = \underline{\quad} \text{ m}$

c. $5,640 \text{ mL} = \underline{\quad} \text{ mL}, \underline{\quad} \text{ L}$

e. $6 \text{ m}, 6 \text{ dm} = \underline{\quad} \text{ dm}$

g. $6,088 \text{ g} = \underline{\quad} \text{ kg}, \underline{\quad} \text{ g}$

b. $8 \text{ g}, 29 \text{ mg} = \underline{\quad} \text{ mg}$

d. $9,885 \text{ mg} = \underline{\quad} \text{ g}, \underline{\quad}$

f. $\underline{\quad} \text{ dL} = 9 \text{ daL}, 99 \text{ dL} \quad \text{mg}$

h. $2 \text{ kg}, 400 \text{ g} = \underline{\quad} \text{ g}$

7. Something measures 200 centimeters. How many decimeters? How many meters?
 Decimeters: _____ Meters: _____

8. An ant traveled 8 meters from its nest to forage for food. How far is this in centimeters?

9. Sameh drinks 8 glasses of water each day. Each glass contains 300 milliliters.
 Hend drinks 2 liters of water each day. Who drinks more water?

10. A colony of army ants has been known to consume 2 kilograms of food in a month.
 How many grams of food are consumed by the colony?

11. In the first 3 weeks of their science project, Bassem's plant grew 197 millimeters and Mina's plant grew 3 dm. Which plant is longer?

12. Two hundred thousand ants drink 1 liter of water. How many milliliters of water is this?

13. Ahmed and Mona collected rocks for science class. Ahmed's rock weighed 3 kg and Mona's rock weighed 2,500 g. Whose rock weighed more?

14. Kristen and Sara need string for their projects. Kristen needs 25 dm of string, and Sara needs 340 cm of string. How much string do both girls need in centimeters?

15. What's the Error?

- Tony is 2 m tall with shoes. Without shoes, Tony is 3 cm shorter. He wrote his height without shoes as 1,997 cm. Describe his error. Write the correct height.

Multiple Choice Questions

Choose the correct answer.

1. $8 \text{ hm} = \underline{\hspace{2cm}} \text{ m}$

- A. 80
- B. 800
- C. 8,000
- D. 80,000

3. $7 \text{ L} = \underline{\hspace{2cm}} \text{ mL}$

- A. kL
- B. daL
- C. dL
- D. mL

5. Which of the following is the greatest mass?

- A. 50 hg
- B. 6 kg
- C. 800 dag
- D. 8,000 dg

7. $8,200 \text{ mL} = \underline{\hspace{2cm}} \text{ L}, \underline{\hspace{2cm}} \text{ mL}$

- A. 8,2
- B. 8,20
- C. 80,20
- D. 8,200

9. A piece of wood is 2 meters long. What is its length in centimeters?

- A. 2
- B. 20
- C. 200
- D. 2,000

10. The fuel tank of a car is filled with 35 liters of gasoline. How many milliliters are used to fill the tank?

- A. 350
- B. 3,500
- C. 35,000
- D. 350,000

2. $50 \text{ g} = \underline{\hspace{2cm}} \text{ mg}$

- A. 5
- B. 500
- C. 5,000
- D. 50,000

4. $4 \text{ m}, 16 \text{ dm} = \underline{\hspace{2cm}} \text{ dm}$

- A. 416
- B. 4,160
- C. 56
- D. 4,016

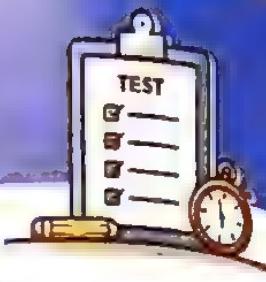
6. $7 \text{ dm} \underline{\hspace{2cm}} 700 \text{ mm}$

- A. <
- B. =
- C. >
- D. otherwise

8. $4 \text{ kg}, 500 \text{ g} + 2 \text{ kg}, 200 \text{ g}$

- = $\underline{\hspace{2cm}} \text{ kg}, \underline{\hspace{2cm}} \text{ g}$
- A. 6,300
- B. 6,700
- C. 2,700
- D. 2,300

Concept 1 Assessment | Unit 3



1. Put (✓) to the correct answer and (✗) to the incorrect answer.

- a. $6\text{ km}, 6\text{ m} = 66\text{ m}$
- b. $1\text{ L} = 100\text{ mL}$
- c. $5,677\text{ mm} = 5\text{ m}, 677\text{ mm}$
- d. $30\text{ m} = 3\text{ dm}$
- e. $5\text{ L} > 5\text{ dL}$
- f. $5\text{ kg} + 4,000\text{ g} = 9\text{ kg}$

2. Choose the correct answer.

- a. $1\text{ km} = 1,000$ —
 - A. hm
 - B. dam
 - C. m
 - D. dm
- b. $5\text{ g} =$ — mg
 - A. 50
 - B. 500
 - C. 5,000
 - D. 50,000
- c. $4,400\text{ m} =$ — km, — m
 - A. 4,4
 - B. 4,40
 - C. 4,400
 - D. 40,40
- d. $4\text{ L} + 5,342\text{ mL} =$ — mL
 - A. 9,342
 - B. 5,742
 - C. 5,382
 - D. 5,346
- e. $7\text{ g}, 35\text{ mg} =$ — mg
 - A. 735
 - B. 7,035
 - C. 7,350
 - D. 70,350
- f. 6 L — 700 mL
 - A. <
 - B. >
 - C. =
 - D. otherwise

3. Complete.

- a. $9,000\text{ g}$ is equivalent to — kilograms.
- b. 180 dm is equivalent to — meters.
- c. — $\text{mL} = 600\text{ L}$
- d. $3\text{ km} + 3,000\text{ m} =$ — km
- e. $11\text{ kg}, 800\text{ g} - 9\text{ kg}, 520\text{ g} =$ — kg, — g
- f. $5\text{ L} - 3,000\text{ mL} =$ — L

4. Match the cards that have the same measurement.

- a. 3 L
- b. 3 kg
- c. 3 km
- d. 3 m

- 1. 3,000 m
- 2. 3,000 mm
- 3. 3,000 mL
- 4. 3,000 g

5. List 20 m , 2 km , 2,100 dm , 2,000 mm from least to greatest.

6. A bag of seeds weighs 2 kg. What is the weight of this bag in grams ?

7. Is the distance from your elbow to your wrist closer to 15 mm or 15 cm ?

8. David drinks 8 glasses of water each day. Each glass contains 300 milliliters.

Mostafa drinks 2 liters of water each day. Who drinks more water ?

9. An adult's body has about 5 liters of blood. How many milliliters of blood is this ?

10. If you walked 50 meters to a neighbor's house and then 50 meters back again.

Did you walk 1 kilometer ? Explain.

11. If the mass of a colony of ants is 38 kilograms, 27 grams, 27 grams,

Rewrite this mass in grams.

12. Hassan practices running and needs to drink 400 mL of water during training 5 times a day.

How many liters of water does Hassan drink in the day ?

Concept

2

Time and Scaled Measurements



Fast Fact

The first pocket watch was invented in the 1500's by Peter Henlein. It only had an hour hand. The minute hand was added in the late 1600's.



Concept Overview

In concept 2 :

Time and Scaled Measurements, students tell time to the minute, solve problems with elapsed time, and represent measurement data with a scale. These skills and concepts are a challenging extension and application of what students previously learned in Primary 2 and 3.

Lesson No	Lesson Name	Vocabulary Terms	Learning objectives
Lesson 5	3-5 What time is it?	Analog - Decade - Digital - Elapsed - Ratio Table	<ul style="list-style-type: none">Students will tell time to the minute.Students will explain relationships between units of time.
	3-6 How long does it take?	Conversion - Elapsed time - Open number line	<ul style="list-style-type: none">Students will explain elapsed time.Students will solve elapsed time problems.Students will explain the strategies they use to solve elapsed time problems.
Lesson 6	3-7 Scaled Measurements	Line plot - Scale	<ul style="list-style-type: none">Students will create line plots to represent given data.Students will select an appropriate key and scale for a line plot.Students will write questions that can be answered by their line plots.

3-5 What Time Is It ?

3-6 How Long Does It Take ?

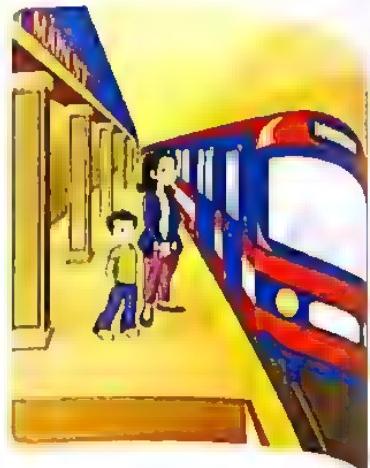
Learn What Time Is It ?

This morning, Amgad's family will take a ride on the railroad. The train leaves at 11 o'clock.

Amgad's family is in the station waiting room. The time right now is shown on the clock

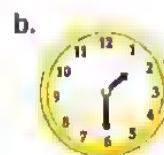


Has Amgad's family missed the train ?
The time on the clock is 10:50 or 10 to 11.
So, Amgad's family has not missed the train.



Example 1

Write the time shown on the clock in two different ways :



Solution

- | | |
|---------------------------|--------------------------------|
| a. It is 2 o'clock , 2:00 | b. It is half past 1 , 1:30 |
| c. It is 5 to 8 , 7:55 | d. It is quarter past 9 , 9:15 |

Units of Measuring Time

- Week , day , hour , minute , second , these units are used to measure time.

$$1 \text{ Week} = 7 \text{ days} \quad 1 \text{ day} = 24 \text{ hours (hr)} \quad 1 \text{ hour} = 60 \text{ minutes (min)}$$

$$1 \text{ minute} = 60 \text{ seconds (sec)}$$

Notes for parents :

- Ask your child to count from 7:00 to 8:00 using 5-minutes intervals (7:00, 7:05, 7:10 and so on)

1. Relating Weeks and Days

The table helps you see how weeks and days are related.

$$1 \text{ week} = 7 \text{ days}$$

Week	1	2	3	4	5	...
Day	7	14	21	28	35	...



Example 2

How many days are there in.

a. 5 weeks.

b. 13 weeks

Solution

a. You can use multiplication : $5 \text{ weeks} = 5 \times 7 = 35 \text{ days}$.

or You can use repeated addition : $5 \text{ weeks} = 7 + 7 + 7 + 7 + 7 = 35 \text{ days}$.

$$\text{b. } 13 \text{ weeks} = 13 \times 7 = 7 \times (10 + 3)$$

10 (3)

$$= 7 \times 10 + 7 \times 3 = 70 + 21 = 91 \text{ days}$$

Think :

$$1 \text{ week} = 7 \text{ days}$$

"Distributive property of multiplying"

2. Relating Days and Hours

The table helps you see how days and hours are related.

$$1 \text{ day} = 24 \text{ hours}$$

Day	1	2	3	4	5	...
Hour	24	48	72	96	120	...



* Remind your child the distributive property of multiplying.

Example 3

How many hours are there in 8 days?

Solution

Extend the previous pattern by using its pattern rule, + 24

$+24$	$+24$	$+24$	$+24$	$+24$	$+24$	$+24$	$+24$
24	48	72	96	120	144	168	192
↓ 1 day	↓ 2 days	↓ 3 days	↓ 4 days	↓ 5 days	↓ 6 days	↓ 7 days	↓ 8 days

So, 8 days = 192 hours.

Another way using multiplication

$$8 \text{ days} = 8 \times 24 = 8 \times (20 + 4)$$

"Distributive property of multiplying"

$\begin{array}{r} 20 \\ \times 8 \\ \hline 160 \end{array}$

$$= [8 \times 20] + [8 \times 4] = 160 + 32 = 192 \text{ hours.}$$

3. Relating [hours and minutes] - [minutes and seconds]

The following tables help you see how hours and minutes are related, and how minutes and seconds are related.

1 hour = 60 minutes							
Hour	1	2	3	4	5	...	$\times 60$
Minute	60	120	180	240	300	...	
	$+60$	$+60$	$+60$	$+60$			

1 minute = 60 seconds							
Minute	1	2	3	4	5	...	$\times 60$
Second	60	120	180	240	300	...	
	$+60$	$+60$	$+60$	$+60$			

**Notes for parents :**

- Ask your child how many hours there are in a week

Example 4

Complete.

a. 8 hours = minutes.

b. 9 minutes = seconds.

Solution 

a. [Think: 1 hour = 60 minutes]

$$8 \text{ hours} = 8 \times 60 = 480 \text{ minutes.}$$

b. [Think: 1 minute = 60 seconds]

$$9 \text{ minutes} = 9 \times 60 = 540 \text{ seconds.}$$

Math tip

You can multiply $8 \times 6 = 48$
and put the zero at
the end "480"

Example 5

Find the missing numbers.

a. 4 weeks , 2 days = days.

b. 5 days , 5 hours = hours.

c. 3 hours , 20 minutes = minutes.

d. 2 minutes , 30 seconds = seconds.



You can use
different strategies
to convert units.

Solution 

a. $4 \text{ weeks} = 4 \times 7 = 28 \text{ days.}$

$$\text{So, } 4 \text{ weeks , 2 days} = 28 \text{ days} + 2 \text{ days} \\ = 30 \text{ days.}$$

b. $5 \text{ days} = 5 \times 24 = 5 \times (20 + 4)$

$$= 100 + 20 = 120 \text{ hours}$$

So, $5 \text{ days , 5 hours} = 120 \text{ hours} + 5 \text{ hours}$

$$= 125 \text{ hours.}$$

c. $3 \text{ hours} = 3 \times 60 = 180 \text{ minutes.}$

$$\text{So, } 3 \text{ hours , 20 minutes} \\ = 180 \text{ minutes} + 20 \text{ minutes} = 200 \text{ minutes.}$$

d. $2 \text{ minutes} = 2 \times 60 = 120 \text{ seconds}$

$$\text{So, } 2 \text{ minutes , 30 seconds} \\ = 120 \text{ seconds} + 30 \text{ seconds} = 150 \text{ seconds.}$$

Check your understanding

Fill in the blanks.

a. 5 hours , 10 minutes = minutes. b. 3 days , 10 hours = hours.

c. 4 minutes , 11 seconds = seconds. d. 2 weeks , 2 days = days.

• Remind your child how to multiply by multiples of 10

Learn How long does it take ? (Elapsed time)

Elapsed time is the time that passes from the start to the end of an activity.

Example 6

Laila entered a shopping mall, spent 2 hours .
40 minutes shopping , and spent 50 minutes
at lunch in a restaurant, and then left the mall.
How long did Laila spend in the mall ?



Solution

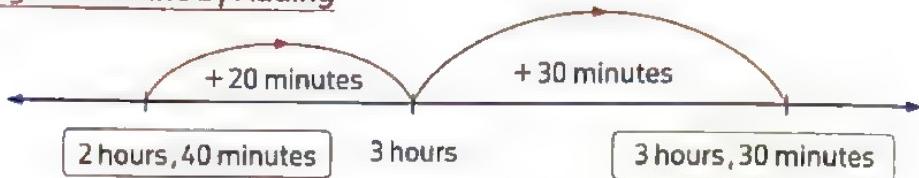
There are different ways to calculate the elapsed time.

1. Add Times

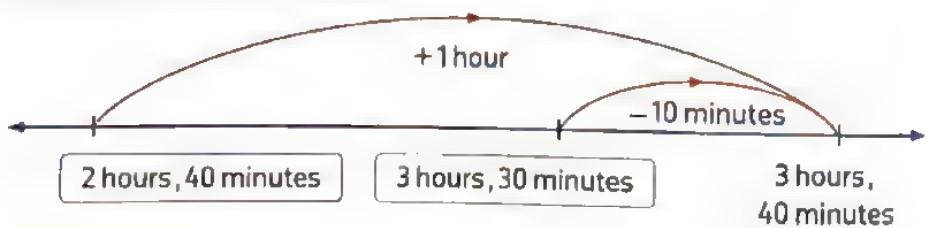
$$\begin{array}{r}
 \text{Hours} : \text{Minutes} \\
 2 : 40 \\
 + \quad : \quad 50 \\
 \hline
 2 : 90 \quad [\text{Rename } 90 \text{ minutes as } 1 \text{ hour } 30 \text{ minutes}] \quad 60 \text{ minutes} = 1 \text{ hour}
 \end{array}$$

So, 2 hours + 1 hour + 30 minutes = [3 hours , 30 minutes]

2. Using a Time Line by Adding



3. Using a Time Line by Subtracting



Notes for parents :

- Help your child to find the elapsed time using different ways.

4. Convert Units

[Think : 1 hour = 60 minutes]

So, 2 hours = $2 \times 60 = 120$ minutes.

Then 2 hours, 40 minutes + 50 minutes = 120 minutes + 40 minutes + 50 minutes = 210 minutes

Then, 210 minutes = 180 minutes + 30 minutes = [3 hours, 30 minutes]

Example 7

Yasser finds that a cinema show is full when he arrives at 7:50 A.M. next show begins at 9:30 A.M.
How long will he have to wait for the next show?

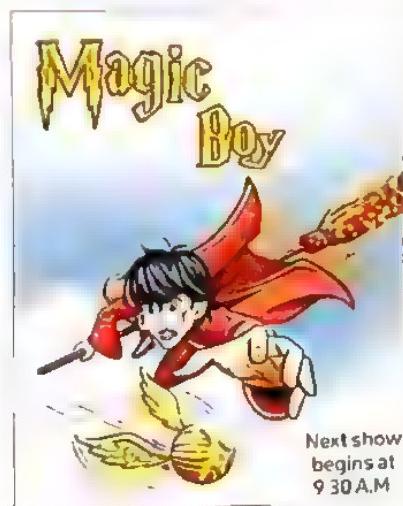
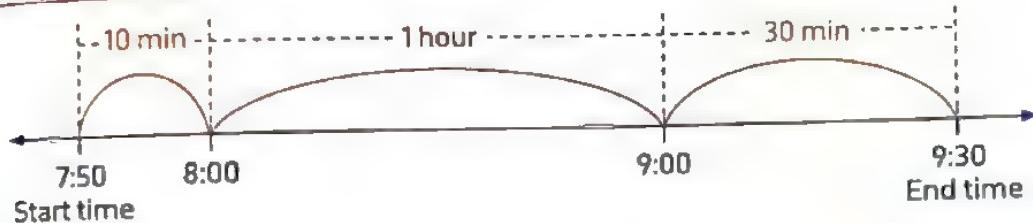
Solution

There are different ways to calculate the elapsed time.

1. Subtract Times

$$\begin{array}{r}
 \text{Hours} \quad : \quad \text{Minutes} \\
 \begin{array}{r}
 8 \qquad \qquad \qquad 90 \\
 + 60 \\
 \hline
 9 \qquad : \quad 30 \\
 - 7 \qquad : \quad 50 \\
 \hline
 1 \qquad : \quad 40
 \end{array}
 \end{array}$$

So, he will wait 1 hour, 40 minutes for the next show.

2. Using a Time Line

So, he will wait 1 hour, 40 minutes for the next show.

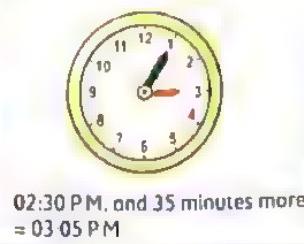
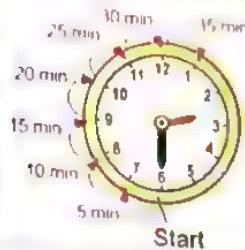
Example 8

Bassem left school at 2:30 P.M. and arrived home 35 minutes later.

What time did Bassem arrive home?

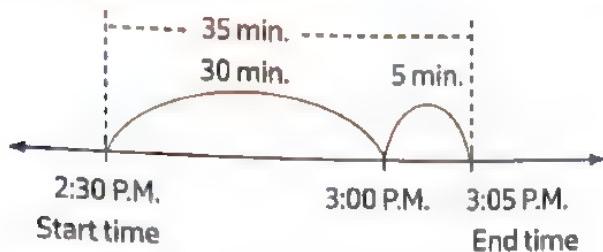


Ask your child what time will be 2 hours after 11:35 A.M.

Solution**1. Count Forward on a Clock****Math tip**

When counting forward on a clock, increase one hour for each cross on 12.

So, Bassem arrived home at 3:05 P.M.

2. Using a Time Line

So, Bassem arrived home at 3:05 P.M.

Example 9

Calculate.

a. $3:15 + 6:20 =$

b. $5:37 + 50 \text{ minutes} =$

c. $7:35 - 40 \text{ minutes} =$

Solution

a. Hours Minutes

$$\begin{array}{r} 3 : 15 \\ + 6 : 20 \\ \hline 9 : 35 \end{array}$$

Another Solution

Hours

$$\begin{array}{r} 3 : 15 + 6 : 20 = [3 + 6] : [15 + 20] \\ \curvearrowright \qquad\qquad\qquad \curvearrowright \\ \text{Minutes} \qquad\qquad\qquad = 9 : 35 \end{array}$$

You can use different ways to calculate each one



b. Hours Minutes

$$\begin{array}{r} 5 : 37 \\ + 1 : 50 \\ \hline 6 : 87 \end{array}$$

$87 \text{ min} = 60 \text{ min} + 27 \text{ min}$
 $= 1 \text{ hr} + 27 \text{ min}$

c. Hours +60 Minutes

$$\begin{array}{r} 6 : 95 \\ \cancel{+} : 35 \\ \hline 6 : 40 \end{array}$$

Check your understanding

Peter completed a bike ride 3 hours and 26 minutes after he started. He started the bike ride at 8:15 A.M. At what time did he finish?

Notes for parents :

- Ask your child how many hours and minutes pass from the time he/she leaves for school until he/she returns home

Exercise 17

REMEMBER

PROBLEM SOLVING

From the school book

1. Write the time.

a.



: :

b.



: :

c.



: :

2. Write the time in two ways.

a.



: :

It's _____

b.



: :

It's _____

c.



- : - -

It's _____

3. Complete each of the following tables.

Week	Day
1	7
2	
3	
4	
5	
6	
7	
8	
9	
10	

Day	Hour
1	24
2	
3	
4	
5	
6	
7	
8	
9	
10	

Hour	Minute
1	60
2	
3	
4	
5	
6	
7	
8	
9	
10	

Minute	Second
1	60
2	
3	
4	
5	
6	
7	
8	
9	
10	

4. Solve the conversion problems.

- 10 hours, 30 minutes = _____ minutes.
- 3 weeks, 3 days = _____ days.
- 6 minutes, 15 seconds = _____ seconds.
- 4 days, 20 hours = _____ hours.
- 4 weeks, 2 days = _____ days.
- 7 hours, 20 minutes = _____ minutes.
- 2 days, 12 hours = _____ hours.
- 5 minutes, 12 seconds = _____ seconds.
- 1 day, 10 hours = _____ hours.
- 10 hours, 7 minutes = _____ minutes.

5. Compute the time.

- | | |
|--|------------------------------------|
| a. $3:25 + 45 \text{ minutes} =$ _____ | b. $3:25 + 1:26 =$ _____ |
| c. $7:50 - 39 \text{ min} =$ _____ | d. $5:43 - 1:25 =$ _____ |
| e. $3:45 + 25 \text{ min} =$ _____ | f. $2:45 + 6:17 =$ _____ |
| g. $4:29 + 5:31 =$ _____ | h. $8:20 - 17 \text{ min} =$ _____ |
| i. $3:07 - 42 \text{ min} =$ _____ | j. $5:07 - 2:13 =$ _____ |

6. Find the elapsed time.

- | | | |
|---------------------------------------|--|---------------------------------------|
| a. Start: 1:20 P.M.
End: 9:50 P.M. | b. Start: 6:40 A.M.
End: 10:17 A.M. | c. Start: 4:27 P.M.
End: 8:00 P.M. |
| d. From: 6:43 A.M.
To: 9:43 A.M. | e. From: 6:15 A.M.
To: noon | f. From: 11:40 A.M.
To: 1:20 P.M. |

7. Answer the following.

a. ☐ An average ant works for 19 hours a day. How many hours does an ant work in 3 days ?

b. ☐ Amir's family used their computer for 3 hours on Saturday, 4 hours on Sunday and 5 hours on Monday. How many total minutes were they on the computer? How many seconds ?

c. ☐ A worker ant takes 240 naps a day. Each nap lasts 1 minute.

>About how many hours did the nap ant ?

d. ☐ Use the life cycle of an ant to answer the questions that follow.

* 1. Once the queen ant lays eggs, it can take anywhere from 7 to 14 days for them to hatch into the larvae stage. If it takes 10 days for a species of ant eggs to hatch, how many hours would that be ?

2. Adult ants feed the larvae liquid and solid food which helps them to grow quickly. Most move into the next stage, pupae, in 6 - 12 days. If it takes a larvae 6 days and 13 hours, how many total hours will that be ?

3. The pupae are white and similar to adult ants with their legs and antennae folded by the body and covered by a white or brown colored cocoon. They emerge as adults somewhere between 9 and 30 days. If it takes the ant 21 days, how many weeks will that be ?

- e. Jana and Maha have 5 hours to watch three movies that last 1 hour and 22 minutes, 2 hours and 12 minutes; and 1 hour and 57 minutes.
1. Do the girls have enough time to watch all three movies? How do you know?

2. The girls decide to just watch the two shortest movies. If they start watching them at 5:30 P.M., what time will their movies end?

- f. An ant's first nap of the day began at 7:45 A.M. and lasted for 60 seconds.
What time did the ant wake up?

2. The ant then worked in the colony for 3 hours and 13 minutes before its next nap. What time did the ant take his second nap?

- g. A worker ant went out to find food for the colony. It left at 6:30 A.M. and returned at 7:42 A.M. How long was that ant looking for food?

- h. **What's the Error?** Jim says the elapsed time from 7:35 A.M. to 8:45 P.M. is 1 hr 10 min.
Describe his error. Write the correct answer.

Multiple Choice Questions

Choose the correct answer.

1.



- A. 1:07 B. 1:35 C. 2:07 D. 2:35

2. 7 hours = - minutes

- A. 70 B. 140 C. 420 D. 700

4. $2:50 + 40 \text{ minutes} = -$

- A. 2:10 B. 3:10 C. 2:54 D. 3:30

6. $6:43 - 50 \text{ minutes} = -$

- A. 6:53 B. 5:07 C. 5:53 D. 6:07

7. Mai has worked on her sewing project 45 min each night for 4 nights. She plans to spend 4 hr on her project during one week. How much more time does she need to spend on her project ?

8. Sameh wants to know how many hours he has spent in school this year. If he has been in school 145 days, and each day he has spent 7 hr at school, how many hours has he been in school this year ?

- A. 940 B. 1,015 C. 1,230 D. 2,150

9. At 9:20 A.M. a teacher set a timer for 30 minutes quiet reading time. What time will it be when the timer rings ?

10. On Saturday morning Peter began cutting the grass at 9:35 A.M. He finished at 10:43 A.M. How long did it take Peter to cut the grass ?

- A. 1:08 B. 1:10 C. 2:08 D. 2:40

- A. 9:50 P.M. B. 9:50 A.M. C. 9:10 A.M. D. 10:05 P.M.

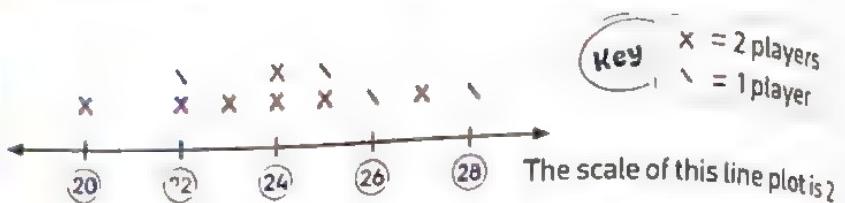
3-7 Scaled Measurements

Learn Line plot

Line plot is a graph that shows the data as X's above a number.

Example 1

Players' ages of handball team → What the line plot shows



- What does this line plot show ? Players' ages of handball team.
- What does each x represent ? 2 players
- What is the scale for this line plot ? 2
- How many players in the team are 24 years ? 4
- How many players in the team are 27 years ? 2
- How many players in the team are 22 years ? 3
- How many players are represented in all ? 18

Learn Measuring Capacity

Graduated cylinder is a graduated tool like ruler from 0 to 100 , and it holds 100 mL.

For example :

There is 60 mL of liquid in the graduated cylinder.

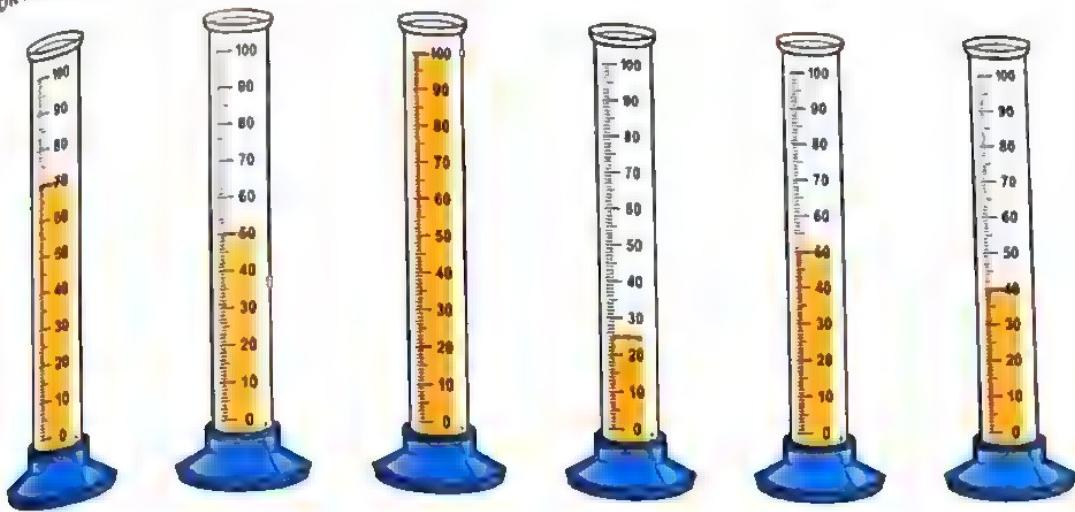


Notes for parents :

- Remind your child that a number line can start at any number and the numbers go on forever

Example 2

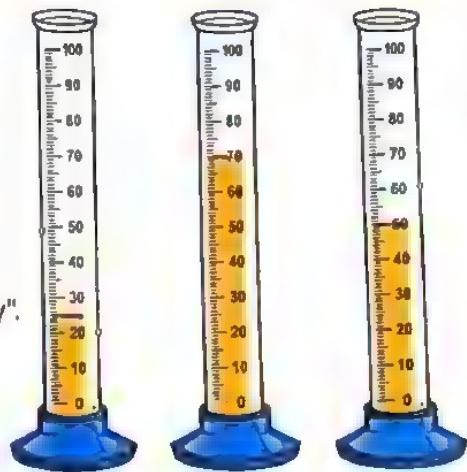
Look at the graduated cylinders and answer the questions.



- What title would you use to represent this data?
- What key would you use to represent this data?
- What scale would you use to represent this data?

Solution

- Liquid in the graduated cylinders "Answers may vary".
- One "Because it is a small set of information".
- 5 or 10

**Check your understanding**

A line plot has a scale of 3. The first number on the scale is 12. There are 5 marks on the line plot. What is the last number on the line?

*Help your child to choose a suitable title, for the previous graduated cylinders.

Exercise 18

3-7 Scaled Measurements

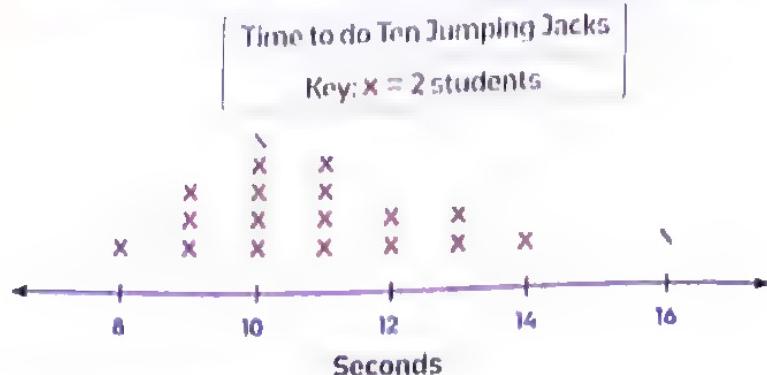
REMEMBER

LEARN MORE

PROBLEM SOLVING

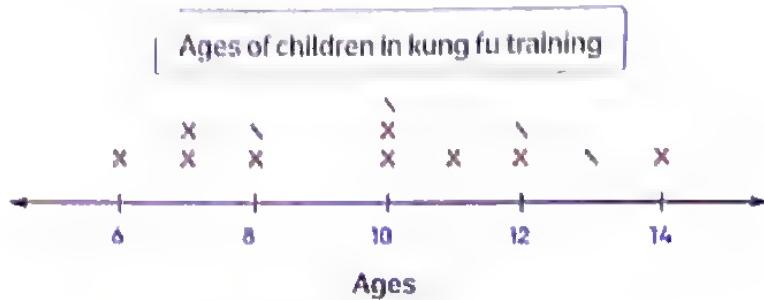
From the school book

1. Look at the line plot and be prepared to answer the following questions.



1. What does this line plot show?
2. What does each X represent?
3. How many students are represented?
4. What is the scale for this number line?

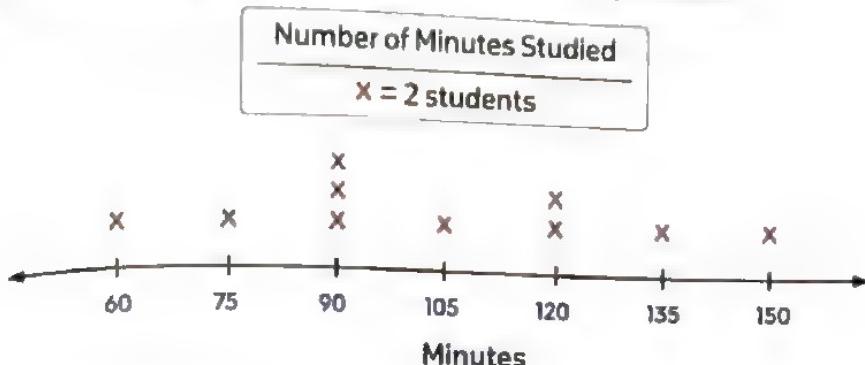
2. Use the line plot to answer the questions.



Key $\text{Each X stands for 2 children}$

- a. What does this line plot represent?
- b. What is the scale for this line plot?
- c. How many children in the training are 10 years?
- d. How many children are in kung fu training in all?
- e. What age is the greatest number of children?

3. Use the following line plot to answer the following questions.



1. What is being measured?

2. What is the scale for the number line?

For problems 3 - 5, record your answer in total minutes and then convert your answer to hours and minutes.

3. What was the least amount of time spent studying?

4. What was the most amount of time spent studying?

5. What was the most common amount of time spent studying?

4. The following table shows the masses of Ahmed's friends in a class in kilograms

46	40	44	47	42	42	41	46	43	47
42	44	47	40	44	46	43	48	46	44

a. Create a line plot that shows this measurement data.



b. What is the number of Ahmed's friends in the class?

c. How many friends of mass 42 kg?

d. What mass is the greatest number of friends?

5. **Look at the table, which lists the length of a variety of ants around the world. Use it to answer the following questions.**

Ant Type	Length (in mm)	Ant Type	Length (in mm)
Ghost ant	1	Red harvester ant	6
Thief ant	2	Siafu ant	7
Pharaoh ant	2	Carpenter ant	9
Argentine ant	3	Trap jaw ant	9
Fire ant	4	Panda ant	8
Sugar ant	5	Dinosaur ant	10
Crazy ant	3	Leaf cutter ant	10
African ant	10	Flying ant	18
Pavement ant	3	Bullet ant	24
Army ant	3	Cow ant	19
Black garden ant	4	Bull ant	40

1. Create a line plot that shows this measurement data.

Remember to include a title, key, and use a scaled number line to include all lengths.
Then, answer the questions that follow.



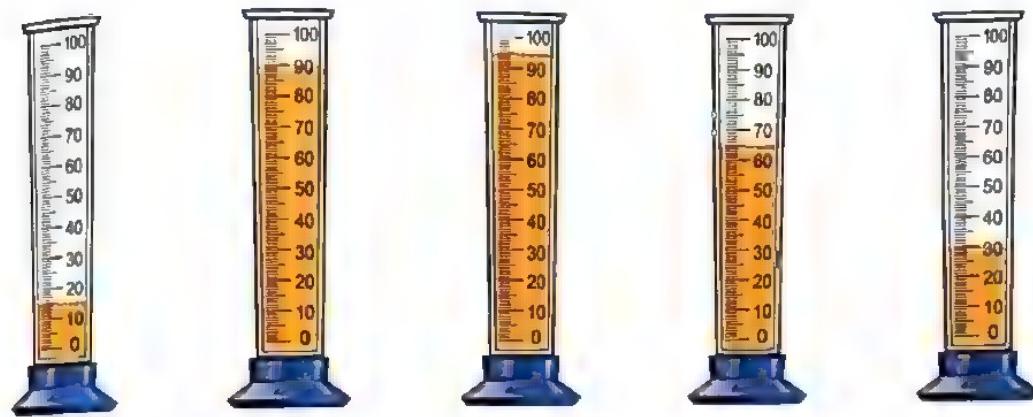
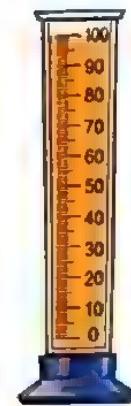
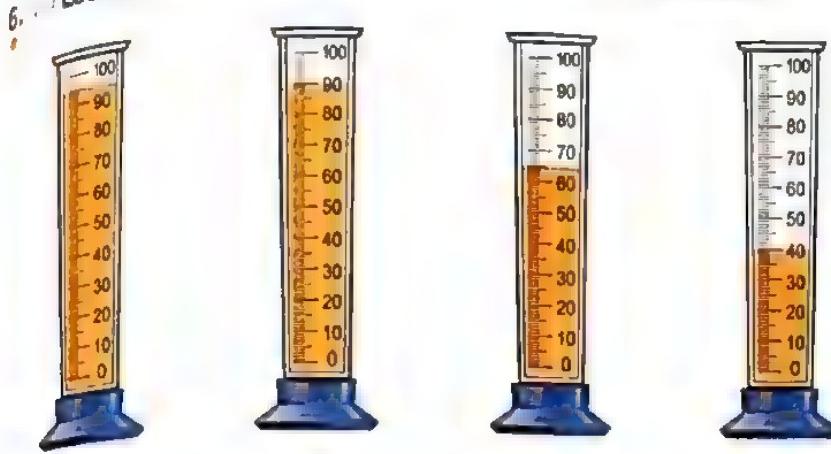
2. Why did you make your key the way you did?

3. Why did you make your scale the way you did?

4. Write three questions that could be answered by the data in this line plot.

5. If you added the Titanomyrma lubei that could be as large as 99 mm, how would that affect your line plot?

Look at the graduated cylinders and answer the questions.



1. What title would you use to represent this data ?

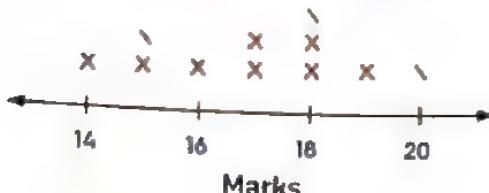
2. What key would you use to represent this data ?

3. What scale would you use to represent this data ?

Multiple Choice Questions

- 1.** Use the line plot.

Marks of students in an exam



Key $\text{x} = 2 \text{ students}$

How many students are in the class in all?

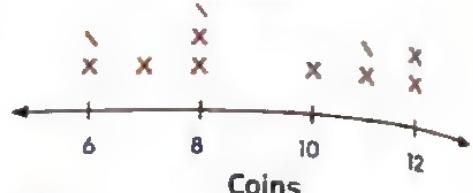
- A. 14 B. 19
C. 21 D. 22

- 3.** A line plot has a scale of 5. The first number on the scale is 15. There are 6 marks on the line plot. What is the last number on the line?

- A. 10 B. 20
C. 30 D. 40

- 2.** Use the line plot.

Saved coins



Key Each x stands for 2 children

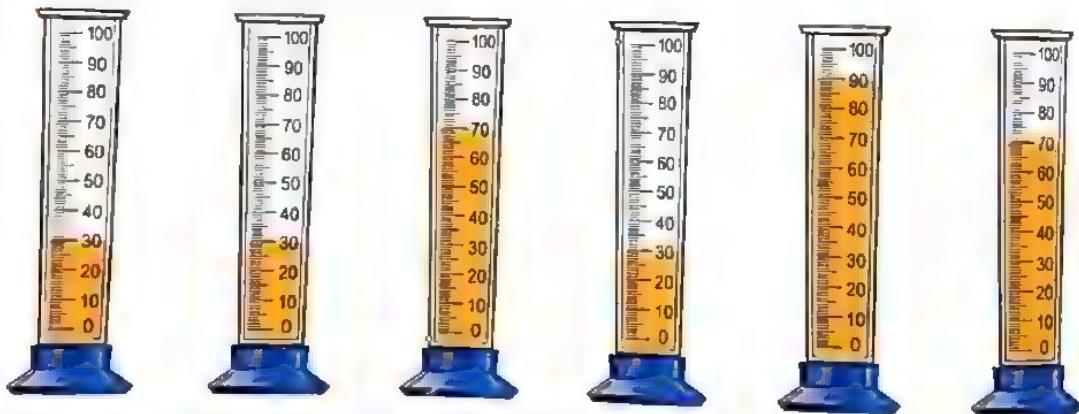
What is the scale for this line plot?

- A. 1 B. 2
C. 3 D. 4

- 4.** The key of a line plot indicates that each $\text{x} = 4 \text{ children}$. One of the data points on the line has 6 X's. How many children does that represent?

- A. 12 B. 24
C. 36 D. 48

- 5.** Look at the graduated cylinders,



What scale would you use to represent this data?

- A. 10 B. 50
C. 100 D. 200

Concept 2 Assessment | Unit 3

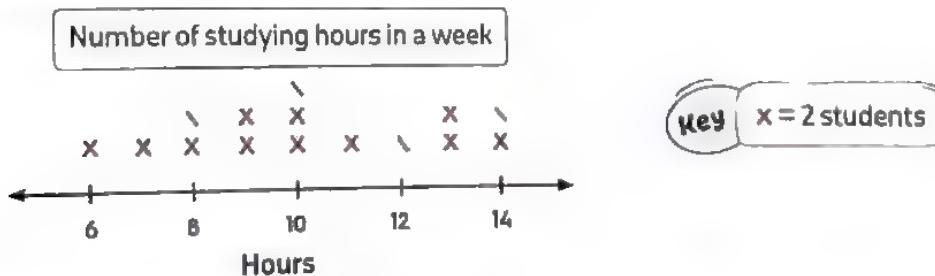


1. Put (✓) to the correct answer and (✗) to the incorrect answer.

- a. $2 \text{ days} = 10 \text{ hours}$ []
- b. $5 \text{ weeks} = 35 \text{ days}$ []
- c. $1 \text{ second} = 60 \text{ minutes}$ []
- d. $100 \text{ minutes} = 1 \text{ hour}, 40 \text{ minutes}$ []
- e. $5:15 + 2:45 = 8:00$ []
- f. $7:10 - 30 \text{ minutes} = 6:30$ []

2. Choose the correct answer.

- a. $2 \text{ minutes} = \underline{\hspace{2cm}}$ seconds.
A. 30 B. 60 C. 90 D. 120
- b. $3 \text{ hours} = \underline{\hspace{2cm}}$ minutes.
A. 30 B. 90 C. 180 D. 300
- c. $2 \text{ weeks}, 6 \text{ days} = \underline{\hspace{2cm}}$ days.
A. 8 B. 20 C. 26 D. 30
- d. Use the line plot,

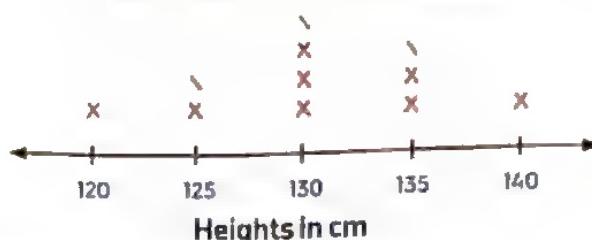


How many students studied 10 hours in a week?

- A. 3 B. 4 C. 5 D. 6
- e. $5:20 + 45 \text{ minutes} =$
A. 6:05 B. 6:10 C. 6:15 D. 6:55
- f. $2 \text{ days}, 2 \text{ hours} = \underline{\hspace{2cm}}$ hours
A. 4 B. 24 C. 48 D. 50

3. Complete the following.

Heights of students in a class



Key

 $x = 1$

- The scale of the opposite line plot is _____.
- $10 \text{ hours} = \underline{\hspace{2cm}} \text{ minutes.}$
- The key of a line plot indicates that each $x = 2$ children. One of the data points on the line has 7 x 's, then it represents _____ children.
- $7 \text{ minutes} = \underline{\hspace{2cm}} \text{ seconds.}$
- $5:40 - 15 \text{ minutes} = \underline{\hspace{2cm}}$
- The elapsed time from 3:10 A.M. to 7:45 A.M. is _____.

4. Match the cards that have the same amount.

- 10 days
- 2 minutes
- 4 days, 4 hours
- 17 weeks, 1 day

- 120 seconds
- 120 days
- 240 hours
- 100 hours

5. How many seconds are in 2 hours?

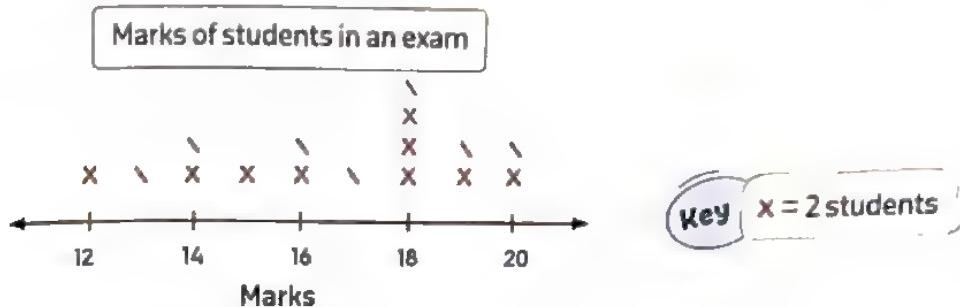


- 6.** Yassin is making bookmarks to sell for charity. Each bookmark takes 6 minutes to make.
How many bookmarks can he make in one hour?

- 7.** After Wael had been at the park for 45 minutes he noticed that the time was 2:3 P.M.
At what time did Wael arrive at the park?

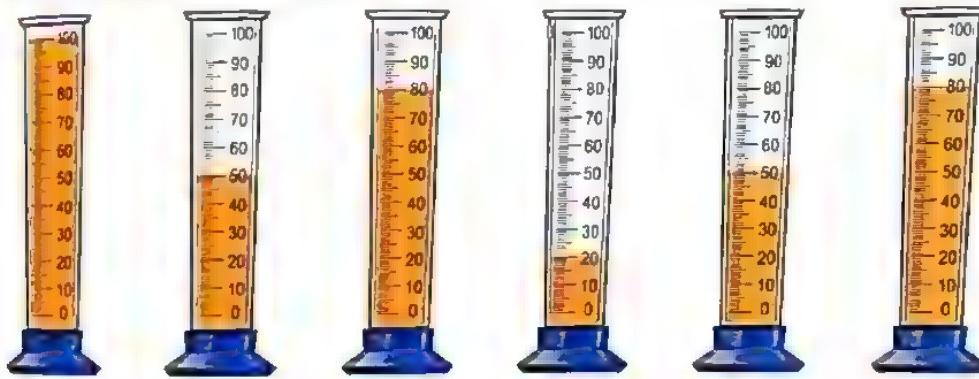
8. As soon as Paula got home from school he worked on his math project for 50 minutes.
 Then he studied for a test for 30 minutes. He finished at 5:45 p.m. At what time did Paula get home from school?
9. A postman starts his shift at 5:30 A.M. and finishes at 8:45 A.M. After his break, he starts his again at 9:30 A.M. and finishes at 11:15 A.M. How long does he actually work for?
10. If the tour starts at 1:45 P.M. and lasts 50 minutes, at what time does the tour end?

11. Use the line plot to answer the following.



- a. What is the scale for this line plot?
 b. How many students got 16 marks?
 c. How many students got less than 14 marks?

12. Look at the graduated cylinders,



- a. What title would you use to represent this data?
 b. What scale would you use to represent this data?

Concept

3

Measurement All Around



Fast Fact

Blue whale is the largest animal to have ever lived on Earth, blue whales can grow to over 30 m long and weight more than (130,000 kg) that's longer than three buses and heavier than three lorries !

Concept Overview

In concept 3:

Measurement All Around, students apply their understanding of measurement and converting measurement units and apply the four operations to solve a variety of story problems. Multiplication and division are explored in Theme 2 of primary 4, so the numbers used for these operations in this unit are appropriate for students to work with at this time.



Lesson No.	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 7	3-8 Measuring The World Around Me. Part 1	Review vocabulary as needed.	<ul style="list-style-type: none">Students will add and subtract to solve problems.Students will solve story problems involving measurement.Students will apply a variety of strategies to solve story problems.
Lesson 8	3-9 Measuring The World Around Me. Part 2	Review vocabulary as needed.	<ul style="list-style-type: none">Students will multiply and divide to solve problems.Students will solve story problems involving measurement.Students will apply a variety of strategies to solve story problems.

3-8 Measuring The World Around Me

"Part 1 : Use Addition and Subtraction"

Problem

Ali and Giovanni each caught a fish.

The two fish have

a mass 8,250 g

The mass of Giovanni's fish

is 3 kg, 530 g

What is the mass of Ali's fish ?



Understand

- What are you asked to find ?
- What information will you use ?
- Is there any information you will not use ? If so, what ?



Plan

- What strategies can you use to solve the problem ?

- Convert measurement units first.

- Use subtraction standard algorithm.



Solve

- How can you use the strategy to solve the problem ?

The mass of Giovanni's fish = 3 kg, 530 g (Think : 1 kg = 1000 g)

$$= 3,530 \text{ g}$$

⑦ ⑫

The mass of Ali's fish = 8,250 – 3,530

$$= 4,720 \text{ g}$$

$$= 4 \text{ kg}, 720 \text{ g}$$



Check

- What other strategy could you use ?

Notes for parents :

In this lesson, your child will use addition and subtraction to solve multistep story problems involving length, mass, capacity, and time.

Example 1

Abeer purchased 7 kilograms of sugar, 10 kilograms of flour, 500 grams of cocoa, 275 grams of pecans, and 225 grams of coconut.

What is the total mass of her groceries in kilograms?

Solution

$$\begin{aligned}\text{The total mass} &= 7 \text{ kg} + 10 \text{ kg} + 500 \text{ g} + 275 \text{ g} + 225 \text{ g} \\ &= [7 + 10] \text{ kg} + [500 + 275 + 225] \text{ g} \quad (\text{Associative property}) \\ &= 17 \text{ kg} + (775 + 225) \text{ g} \\ &= 17 \text{ kg} + 1,000 \text{ g} \\ &= 17 \text{ kg} + 1 \text{ kg} \quad (\text{Convert measurement units}) \\ &= 18 \text{ kg}\end{aligned}$$

Example 2

A tailor used 1 m, 35 cm of cloth to make a shirt and 2 m, 15 cm to make trousers.

What is the total length of cloth used by the tailor to make a shirt and trousers?

Solution

$$\begin{aligned}\text{The total length} &= 1 \text{ m} + 35 \text{ cm} + 2 \text{ m} + 15 \text{ cm} \\ &= [1 + 2] \text{ m} + [35 + 15] \text{ cm} \\ &\quad (\text{Commutative and associative}) \\ &= 3 \text{ m} + 50 \text{ cm} \\ &\approx 3 \text{ m and } 50 \text{ cm} = 350 \text{ cm}\end{aligned}$$

Another strategy

- Convert measurement units first
 $1 \text{ m}, 35 \text{ cm} = 135 \text{ cm}$
 $2 \text{ m}, 15 \text{ cm} = 215 \text{ cm}$
 $\text{The total length} = 135 + 215$
- Use Break up and Bridge strategy
 $135 = 100 + 30 + 5$
 $215 = 200 + 10 + 5$
 $300 + 40 + 10 = 350 \text{ cm}$

Ask your child what strategy he/she decided to use, and why he/she chose it.

Strategies

- Estimate
- Use smaller numbers
- Draw a picture or model (number line, bar model, diagram, and so on)
- Write an equation with the unknown
- Use the standard algorithm
- Find a hidden question
- Convert measurement units first
- Make a benchmark number

Example 3

A fish tank with a capacity of 92 liters is filled with 23,000 milliliters of water. How many more liters of water are needed to fill it up completely?

Solution 

Convert measurement units first.

$$23,000 \text{ mL} = 23 \text{ L} \quad [\text{Think: } 1,000 \text{ mL} = 1 \text{ L}]$$

Number of liters needed to fill up the tank

$$\begin{array}{r} 8 \\ 92 \\ - 23 \\ \hline \end{array}$$

$$= 69 \text{ L}$$

(Standard subtraction algorithm)

Another way to subtract 92 - 23

Add to subtract strategy
 $23 + 7 = 30$

$$30 + 60 = 90$$

$$90 + 2 = 92$$

$$So, 7 + 60 + 2 = 69$$

$$\text{Then } 92 - 23 = 69$$

Example 4

Ahmed studied from 3 : 15 – 4 : 45. His sister, Sarah studied from 4 : 30 – 6 : 15

Who studied longer and by how much?

Solution 

Ahmed

hr.	min.
4	45
- 3	15
1	30

The time of Ahmed = 1 hr. and 30 min.

$$= 60 + 30 = 90 \text{ min.}$$

Sarah

hr.	min.
⑤ 6	15 <small>(75)</small>
- 4	30
1	45

(60 + 15)

The time of Sarah = 1 hr. and 45 min.

$$= 60 + 45 = 105 \text{ min.}$$

So, Sarah studied longer than Ahmed and the difference = $105 - 90 = 15 \text{ min.}$

**Check your understanding**

- Two wooden planks of lengths 12 m, 60 cm and 18 m, 63 cm are glued together to make a long wooden bridge. What is the total length of the bridge?
- Ashraf purchased 7 kg, 200 g of sugar, 9 kg, 395 g of rice. What is the total weight which Ashraf purchased?

Notes for parents :

- Ask your child to use different strategies to solve the problems

Exercise 19

Measuring The World Around Me "Part 1 : Use Addition and Subtraction"

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

Solve as many problems as you can. Use at least three different problem-solving strategies.

First : Problems involving length

1. Samia had 54 m, 20 cm of ribbon to make flowers. 29 m, 39 cm was left unused.
How much ribbon was used to make flowers ?

2. One box is 44 cm, 5 mm tall. Another box is 35 cm. tall. How tall will the boxes be if both are stacked one on top of the other ?

3. Sameh has 63 m of ribbon. If he cuts 56 m, 21 cm ribbon from it, what length of ribbon will be left ?

4. Rania is measuring two ant lines. Colony A's ant line is 30 centimeters long, and Colony B's ant line is 500 millimeters long. How many centimeters long are the two ant lines together ?

5. An ant from Colony A walked 2 kilometers in a day. An ant from Colony B walked 3,000 meters in a day. Which ant walked the farthest and how much farther in kilometers did it walk ?

Strategies

- Estimate
- Use smaller numbers
- Draw a picture or model (number line, bar model, diagram, and so on)
- Write an equation with the unknown
- Use the standard algorithm
- Find a hidden question
- Convert measurement units first
- Make a benchmark number

6. Taher grew 10 centimeters in 1 year. He is now 1 meter, 6 centimeters tall. How many centimeters tall was Taher 1 year ago?
7. Zeina purchased 8 kilograms of sugar, 10 kilograms of flour, 500 grams of cocoa, 225 grams of pecans, and 275 grams of coconut. What is the total mass of her groceries in kilograms?

8. The total weight of Tania's bag is 45 kg, 750 g and Diana's bag is 43 kg, 950 g. Whose bag is heavier and by how much?

9. In Colony A, the ants collect 950 grams of food. If they consume 25 grams of food on Monday and 37 grams of food on Tuesday, how many grams of food are left?

10. Dalia's dog weighs 15 kilograms. When she took it to the vet, she learned that her dog gained 2,000 grams. How many more grams will Dalia's dog need to gain before it weighs 20 kilograms?

11. The potatoes Aya bought weight 2 kilograms, 920 grams. Her onions weighed 1,075 grams less than the potatoes. How much did the potatoes and onions weight together?

12. A worker transferred 10 bags of rice weighing 45 kg each into a truck. The weight of the empty truck is 1,480 kg. What will be the weight of the truck with the bags?

13. (.) Ali's cat weighs 7 kilograms and his dog weighs 17 kilograms. When Ali took them to the vet, he learned that his cat gained 450 grams and his dog gained 120 grams. How much do his two pets weigh in all now?

Third : Problems involving capacity

14. A fish tank with a capacity of 100 liters is filled with 20,000 milliliters of water. How many more liters of water are needed to fill it up completely?

15. Sara bought 500 mL of mustard oil, 250 mL of coconut oil and 2 L of refined oil. What is the total quantity of the 3 oils together?

16. A milkman sold 46 L, 200 mL of milk on 3 days of a week and 53 L, 195 mL of milk in the next 2 days. What quantity of milk did he sell in the 5 days?

17. Mr. Emad bought four 2-liter bottles of soda for the Primary 4 picnic. If there were 2 liters and 829 milliliters of soda remaining at the end of the picnic, how many milliliters of soda did the students drink?

18. Mrs. Basma bought 2 cartons of milk which are 2 liters each. Her three children finished 1,200 milliliters on Monday and 950 milliliters on Tuesday. How many milliliters of milk are left?

Fourth : Problems involving time

- 19.** A bus leaves for Cairo at 4 : 30 P.M. It takes 1 hr, 25 min. to reach there. At what time will it reach at Cairo ?
- 20.** The duration of a film show is 3 hr, 15 min. It starts at 6 : 30 P.M. When will it end ?
- 21.** Rex visited a fashion show. He stayed there for 2 hr, 30 min and came back at home. If he reached the fashion show at 8 : 45 P.M., when did he leave for his home ?
- 22.** A pharaoh ant grows from egg to adult in 45 days. A carpenter ant grows from egg to adult in 12 weeks. Which species takes longer to grow from egg to adult ? How much longer ?
- 23.** Worker ants take power naps totaling up to 250 minutes a day. A queen ant may sleep up to 9 hours a day. Which ant sleeps longer and by how many minutes ?
- 24.** Ziad played his video game from 3 : 45 P.M. until 5 : 10 P.M. He is only allowed to play video games for 80 minutes. Has he broken the rule ? If no, why not ? If yes, by how many minutes ?

 **Challenge**

- 25.** Amal has a rope of length 40 m. She gave 12 m, 53 cm to Amgad, 18 m, 35 cm to Bassem and 9 m, 7 cm to Ayman. What length of rope is still left with Amal ?

D

Multiple Choice Questions

Choose the correct answer.

- | | |
|--|--|
| <p>1. Mr. Martin's spanish class is 45 minutes long. If it starts at 3:30, then it ends at</p> <p>A. 4:30 B. 4:15
C. 4:00 D. 4:45</p> | <p>2. Esslam measured a line for his art project. If it is 200 millimeters long , then the length of this line in centimeters is</p> <p>A. 200 B. 2
C. 20 D. 2,000</p> |
| <p>3. If Sameh bought a rope of length 5,730 cm, then the length of the rope is _____ m and _____ cm.</p> <p>A. 5,730 B. 573 ,0
C. 53 ,70 D. 57 ,30</p> | <p>4. Hany ran 1,800 meters on Saturday and 3 km ,200 m on Sunday. How many meters did be run in all ?</p> <p>A. 5 B. 1,400
C. 4,000 D. 5,000</p> |
| <p>5. A box contains 2 bags of sugar. If the mass of each one is 1 kg and 300 g , what is the total mass in grams ?</p> <p>A. 600 B. 2,600
C. 2,800 D. 1,300</p> | <p>6. If Vector studied from 4 :10 to 5 :00 , then he studied _____ minutes.</p> <p>A. 60 B. 110
C. 40 D. 50</p> |
| <p>7. Peter is over weight. He is 105 kg. If his aim is to loss 500 g per week. then Peter's weight after 2 weeks is _____ kg.</p> <p>A. 104 B. 105
C. 106 D. 107</p> | <p>8. Mr. Bassem bought 3 cartons of juice which are 2 litres each. If his three children finished 4,700 milliliters, then the left of juice is _____ mL</p> <p>A. 2,300 B. 2,700
C. 300 D. 1,300</p> |
| <p>9. Bassem bought 3 meters of rope. He then cut off 170 centimeters of rope to glue around the edge of a pot. How many centimeters of rope does Bassem have left ? _____</p> <p>A. 173 B. 470
C. 130 D. 167</p> | <p>10. Shaimaa poured 5 L of water into a beaker. During an experiment, she added 200 mL of water. How much water was in the beaker at the end of the experiment ? -</p> <p>A. 205 mL B. 2,500 mL
C. 4,800 mL D. 5,200 mL</p> |

3-9 Measuring The World Around Me

"Part 2 : Multiplying and Division"

Problem

A cow gives 22 L and 500 mL of milk daily.
If the milkman has 10 cows, how much milk does he
get in liters in a day ?
And if the daily milk is filled in bottles of capacity
1,000 mL, how many bottles will be required ?
Can you help the milkman ?!



Understand

- What are you asked to find ?
- What information will you use ?
- Is there any information you will not use if so, what ?



Plan

- What strategies can you use solve the problem ?
 - Convert measurement units first.
 - Use division and multiplying algorithm.



Solve

- How can you use the strategies to solve the problem ?
 $22 \text{ L}, 500 \text{ mL} = 22,500 \text{ mL}$
- The milk from 10 cows in mL = $22,500 \times 10 = 225,000 \text{ mL}$
The milk from 10 cows in L = $225,000 \div 1,000 = 225 \text{ L}$
- The capacity of one bottle is 1,000 mL = 1L
Then the milkman needs 225 bottles.



Check

- What other strategy could you use ?

Notes for parents :

- In this lesson, your child use multiplying and division to solve multistep story problems involving length, mass, capacity, and time.

Example 1

Nael has a 20 meter-long piece of wood. He wants to cut it into 4 equal lengths. How long

should each cut piece be in meters?

How long will each of these pieces be in centimeters?

Solution 

. The length of each piece in meters = $20 \div 4 = 5$ m [Think : $4 \times 5 = 20$]

. The length of each piece in centimeters = $5 \times 100 = 500$ cm [Think : $1\text{m} = 100\text{cm}$]

Example 2

A box can carry a total mass of 10 kg. Laptops have to be packed inside the box.

If the mass of each laptop is 2,000 g, how many laptops can be packed inside the box?

Solution 

. The mass of each laptop = 2,000 g = 2 kg. [Think : $1,000\text{g} = 1\text{kg}$]

. The number of laptops can be packed inside the box = $10 \div 2 = 5$ laptops

Example 3

Mona is stringing beads to make a necklace. She is using 30 of the 8 mm beads, 70 of the 4 mm beads, and 40 of the 2 mm beads.

How long will her finished necklace be in cm?

Solution 

$$30 \text{ of } 8 \text{ mm} = 30 \times 8 = 240 \text{ mm}$$

$$70 \text{ of } 4 \text{ mm} = 70 \times 4 = 280 \text{ mm}$$

$$\text{and } 40 \text{ of } 2 \text{ mm} = 40 \times 2 = 80 \text{ mm}$$

$$\begin{aligned} \text{So, the length of her finished necklace} &= 240 + 280 + 80 = 600 \text{ mm} \\ &= 600 \div 10 \\ &= 60 \text{ cm} \end{aligned}$$

* Tell your child that multistep problem needs to know what information do you have to help you solve the problem.

Example 4

Salwa is a runner. She spends half an hour every day running.

How many minutes in total does she run for during a 9-day period?

Solution

What she runs each day = Half an hour = 30 min.

What she runs for during a 9-day period = $30 \times 9 = 270$ min.

**Check your understanding**

In a relay race, 4 people ran 3,000 meters each. In a distance race, John ran

15 kilometers. Who ran farther, the whole relay team or John?

How much farther?

**Notes for parents :**

- Help your child to read and understand to figure out the problem and use the information to decide which operation to use

Exercise 20

REMEMBER

3-9 Measuring The World Around Me "Part 2 : Multiplying and Division"



PROBLEM SOLVING

From the school book

solve as many problems as you can.

First : Problems involving length

1. 1.) Ahmed has a 12 meter-long piece of wood. He wants to cut it into 3 equal lengths.
How long should each cut piece be in meters ? How long will each of these pieces be in centimeters ?

2. 1.) Ants walk about 5,000 meters each day. How many kilometers do ants walk in 6 days ?

3. 1.) An ant may walk up to 5 km per day. If the ant continues this for 20 days, how many meters will the ant walk ?

4. 1.) Sara travelled 9 days continuously. She travelled 5,000 meters each day.
How many kilometers did she walk in all ?

5. A wall has a height of 4 m 20 cm. If each brick is 10 cm high, how many bricks were used to attain the given height of the wall.

6. Eman is building a wind chime. She needs string in the following lengths : six pieces of 20 cm, 3 pieces of 30 cm and one piece of 40 cm. How much string does she need ?

Second : Problems involving mass

7. Ehab is a weightlifter. He has a mass of 100 kilograms. His aim is to gain 500 grams per week. If he does that for 5 weeks, what will his mass be at the end ?
-
8. Mr. Edward bought 200 grams of candy for each of his 10 grandchildren. How many total kilograms of candy did he buy ?
-
9. A colony of ants eats approximately 2,000 grams of food each day. If the ants have 10 kilograms of food stored, how many days will the food last ?
-
10. Mariam was having a picnic with her family and counted 10 ants walking by. If each ant weighed 1 gram and carried 50 times its body weight, how much weight was being carried in all ?

Third : Problems involving capacity

11. A water purifier cleans 10 L , 50 mL of water each day. How much water will be cleaned by the cleaner in 10 days ?
-
12. Ayman is a runner. While Ayman is in training, he needs to drink 500 milliliters of water 4 times per day. How many liters of water will that be for 1 week ?

13. Mostafa has 32 liter bottles of soda. If he divides the soda equally between himself and his 7 friends, how much soda will each person have ?

14. John has a jar filled with juice. After he poured 400 mL of juice in 7 glasses equally. He was still left with 200 mL juice in the jar. What was the capacity of jar in liters ?

Fourth : Problems involving time

15. 1) Samira is studying for an upcoming math test. If she studies for 30 minutes a day, how many hours will she have spent studying in 8 days ?

16. 1) Amany is a swimmer. She spends half an hour every day swimming. How many minutes in total does she swim for during a 5-day period ?

Challenge

17. Usama has 11 L of liquid soap and wants to fill it in 20 cans of capacity 500 mL each.

- Will he be able to fill all the cans completely ?
- How much quantity of liquid soap will be left out ?

18. 1) An ant is at the bottom of a 20-meter deep well and is trying to get to the top. Each day it climbs 4 meters up, but each night it slides back 2 meters. How many days does it take for it to get out of the well ?

D

Choose the correct answer.

1. Sami has 25 meter-long piece of cloth.

If he wants to cut it into 5 equal pieces,
the length of each one equal

(Choose two answers)

A. 4 m

B. 5 m

C. 500 cm

D. 400 cm

2. If Mina travelled 10 days continuously,

He travelled 4,000 meters each
day, then he walk in all about
kilometers.

A. 4

B. 40

C. 400

D. 4,000

3. If Mohamed rides his cycle 10 km per day,

then he covers _____ in 5 days.

A. 2 km

B. 5 km

C. 5,000 m

D. 50 km

4. If the total weight of 10 balls having

same weight is 130,000 grams, then the
weight of each ball is _____ kg.

A. 130

B. 1300

C. 13

D. 13,000

5. If ants walk about 3,000 meters each

day, then the ants walk _____ km
in 5 days.

A. 3

B. 150

C. 15,000

D. 15

6. An ant walk up to 2 km per day. If the ant

continues this for 10 days, then the ant
will walk about _____ meters.

A. 200

B. 2,000

C. 20,000

D. 200,000

7. Thabit has a piece of rope that is 750 centimeters long. He needs to be able to cut this into
6 pieces of rope that are each 110 centimeters long. Is Thabit's rope long enough?

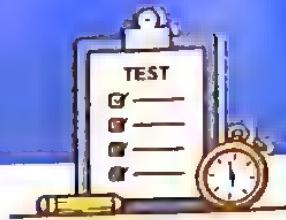
A. No, because $750 \times 6 = 4,500$, $4,500 > 750$

B. Yes, because $110 \times 6 = 660$, $660 < 750$

C. No, because $750 \div 6 = 125$, $125 > 110$

D. Yes, because $750 - 110 - 6 = 634$, $634 < 750$

Concept 3 Assessment | Unit 3



1. Put (✓) to the correct answer and (✗) to the incorrect answer.

- If there is 47 liter and 360 milliliters of water in the tank , 39 liter and 125 milliliters of water is consumed, then the left in the tank is 8 liter and 235 milliliters. []
- If Sarah purchased 2 kg of sugar, 5 kg of flour, 500 g of cocoa, 225 g of pecans, and 275 g of coconut, then the weight of all is 7 kg. []
- If Mr. Ahmed bought a cloth of length 30 m and 80 cm, then its length equal 3,080 cm. []
- Amany has 18 m long piece of wood. If she cut it into 9 equal pieces, then the length of each one equals 200 cm. []
- An ant walk up to 10 km per day. If the ant continues this for 20 days, then the ant will walk 200 m. []
- The duration of a film show is 3 hr. If it starts at 6 : 30 P.M., then it will end at 9 : 30 P.M. []

2. Choose the correct answer.

- Jana has 36 m of ribbon. If she cuts 25 m , 75 cm ribbon from it, then the length of ribbon will be _____
A. 11 m , 25 cm B. 11 m , 75 cm C. 10 m , 25 cm D. 71 m , 75 cm
- If Reham purchased 5 kg , 200 g of sugar and 3 kg , 395 g of rice, then the total mass which Reham carried equal _____
A. 8 kg , 595 g B. 5 kg , 395 g C. 8 kg , 955 g D. 2 kg , 195 g
- Mr. Amgad's class is 45 minutes long. If it starts at 2 : 15 P.M., then it ends at _____ P.M.
A. 3 : 45 B. 2 : 00 C. 2 : 45 D. 3 : 00
- Hany bought 3 cartons of milk which are 2 liters each. If his two children drunk 3,300 milliliters, then the left of the milk is _____ milliliters.
A. 9,300 B. 3,300 C. 2,700 D. 2,000
- If the ant walk about 5,000 meters each day, then the ant walk _____ km in a week.
A. 5,000 B. 35 C. 35,000 D. 5
- If a water purifier cleans 7 L , 50 mL of water each day, then the water will be cleaned by the cleaner in 10 days equal _____
A. 7,500 mL B. 70,500 mL C. 7,050 mL D. 750 mL

3. Complete.

- a. Samira is studying math. If she studies for 30 minutes a day, then the minutes will she have spent studying in 10 days is min.
- b. Wael travelled 5 days continuously. If he travelled 3,000 meters each day, then he walk in all about kilometers.
- c. If Mr. Edward bought 100 grams of candy for each of his 20 friends, then the total kilograms of candy he bought is
- d. Ayman grew 10 cm in 1 year. If he is now 1 m , 60 cm tall, then his tall after 2 years will be cm.
- e. If two wooden planks of length 11 m , 20 cm and 18 m , 80 cm are glued together to make along wooden bridge, then the total length of bridge is m.
- f. If a bus leaves for Alex. at 4 : 30 P.M. it takes 1 hr. , 25 min. to reach there , then the time will it reach at Alex is : P.M.
-
4. The potatoes Aya bought weighed 2 kilograms 920 grams, and onions weighed 1,075 grams. How much did the potatoes and onions weigh together ?
-
5. Ehab is a weightlifter. He has a mass of 100 kilograms. His aim is to gain 500 grams per week. If he does that for 10 weeks, what will his mass be at the end ?
-
6. Worker ants take power naps totaling up to 250 minutes a day. A queen ant may sleep up to 9 hours a day. Which ant sleeps shorter and by how many minutes ?
-
7. Amany is a swimmer. She spends half an hour every day swimming. How many minutes in total does she swim for during a 6-day period ?
-
8. An ant from Colony A walked 2 kilometers in a day. An ant from colony B walked 3,000 meters in a day. Which ant walked the closer and how much closer in kilometers did it walk ?
-
9. Sara traveled 9 days continuously. She traveled 3,000 meters each day. How many kilometers did she walk in all ?
-
10. A fish tank with a capacity of 10 liters is filled with 2,000 milliliters of water. How many more liters of water are needed to fill it up completely ?
-
11. Ayman is a runner. While Ayman is in training, he needs to drink 500 milliliters of water 2 times per day. How many liters of water will that be for 1 week ?



1. put (✓) to the correct answer and (✗) to the incorrect one.

- | | | | |
|---|----------|--|----------|
| a. $1\text{ km} = 100\text{ m}$ | [] | b. $3\text{ dm} = 30\text{ cm}$ | [] |
| c. $2\text{ days}, 10\text{ hours} = 12\text{ hours}$ | [] | d. $505\text{ cm} = 5\text{ m}, 5\text{ cm}$ | [] |
| e. $4\text{ weeks} = 28\text{ days}$ | [] | f. $60\text{ seconds} = 1\text{ hour}$ | [] |

2. Choose the correct answer.

- | | | | | |
|---|-----------------|-----------------|-----------------|-----------------|
| a. $5\text{ kg} = 5,000$ | A. hg | B. day | C. g | D. dg |
| b. $9\text{ m} - 80\text{ cm} =$ | cm | | | |
| A. 1 | B. 10 | C. 100 | D. 820 | |
| c. $\text{--- L} = 17,000\text{ mL}$ | A. 17 | B. 170 | C. 1,700 | D. 170,000 |
| d. A line plot has a scale of 4. The first number on the scale is 8. There are 6 marks on the line plot. What is the last number on the line? | A. 16 | B. 20 | C. 24 | D. 28 |
| e. The elapsed time from 3:50 A.M. to 7:00 A.M. is _____ | A. 3 hr, 50 min | B. 3 hr, 10 min | C. 4 hr, 10 min | D. 4 hr, 50 min |
| f. $17\text{ kg } \square 7,000\text{ g}$ | A. > | B. = | C. < | D. otherwise |

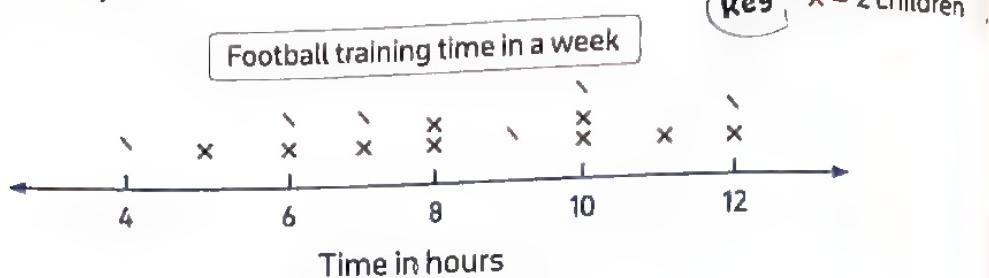
3. Complete each of the following.

- | | |
|--|---------------------------------------|
| a. $8\text{ kg}, 37\text{ g} =$ _____ g | b. $6:34 - 1:25 =$ _____ |
| c. 1 week, 3 days = _____ hours | d. $8:25 + 35\text{ minutes} =$ _____ |
| e. $897\text{ mm} =$ _____ cm, _____ mm | |
| f. The key of a line plot indicates that each X = 2 children. One of the data points on the line has 5 X's, then it represents _____ children. | |

4. Match the card which have the same amount.

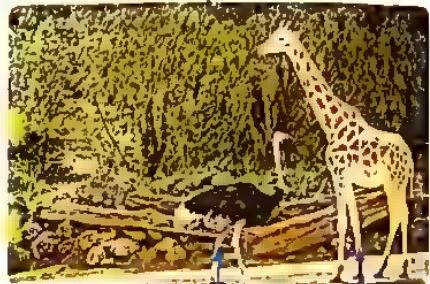
- | | | | |
|-------------|---------------|--------------|----------------|
| a. [4 kg] | b. [4 km] | c. [4 dm] | d. [4 cm] |
| 1. 4,000 m | 2. [400 mm] | 3. [40 mm] | 4. [4,000 g] |

5. List 3 dm, 120 cm, 18 dm, 1 m from greatest to least.
6. Sarah purchased 3 kg, 400 g of sugar and 5 kg, 217 g of rice. What is the total mass which Sarah carried?
7. Hany spent 2 hours, 45 minutes visiting the Zoo. He arrived at 8 : 30 A.M.
What time did he leave?
8. 10 books of height 8 cm, 5 mm each are stacked over one another. What is the total height so obtained?
9. Look at the line plot,



- a. What is the scale for this number line?
- b. What is the number of children trained 7 hours in a week?

10. A giraffe can be 5 meters, 50 centimeters tall.
An ostrich can be 2 meters, 40 centimeters tall.
How much taller is the giraffe than the ostrich in centimeters?



The tallest bird is the ostrich
The tallest mammal is the giraffe

11. A train leaves for Alexandria at 2 : 30 P.M. It takes 1 hour, 25 minutes to reach Banha.
At what time will it reach at Banha?

12. A fizzy can of mass 300 g, Jana bought 6 cans.
What is the total mass of cans in kilograms and grams?

4**Area and Perimeter**

» Concept 1 • Explore Area and Perimeter

**Fast Fact**

Egypt is located mostly in the northeast corner of the African continent. It has a total area close to 1 million square kilometer El-Wadi El-Gidid, also known as New Valley governorate, is the largest among the 27 existing governorates with an area close to 440,000 square kilometers.

Concept

1

Explore Area and Perimeter



The Great Pyramid of Giza (also known as the pyramid of Khufu) is the largest of the three pyramids. Its base is just like a square, the length of each side at the base averaging 230 meters.
What is its perimeter ??



Concept Overview

In concept 1:

Explore Area and Perimeter, students investigate the two-dimensional measurement properties of length, width, perimeter, and area. Students learn and understand the importance of area and perimeter in real-life situations. Students calculate the area of rectangles, use formulas to calculate unknowns when given some dimensions of rectangles, and know how to find the perimeter of any shape. In Theme 2, students delve into multiplication and division. This final unit of Theme 1 is a launch into that study with a conceptual and real-life application.

Lesson No.	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 1	4-1 Marching Ants [Use Formula to Find Perimeter]	Formula - Length - Perimeter - Quadrilateral - Scale - Sum - Width	<ul style="list-style-type: none">Students will define perimeter.Students will use formulas to calculate the perimeter of rectangles.Students will explain how to calculate perimeter.
Lesson 2	4-2 Fill the space [Use Formula to Find Area]	Area - Length - Two-Dimensional - Width	<ul style="list-style-type: none">Students will define area.Students will use formulas to calculate the area of rectangles.Students will explain how to calculate area.
Lesson 3	4-3 Something is Missing!	Area - Dimensions - Formula - Perimeter - Unknown	<ul style="list-style-type: none">Students will use formulas to calculate unknowns when given some dimensions of rectangles.
Lesson 4	4-4 Odd Shapes	Area - Complex - Perimeter	<ul style="list-style-type: none">Students will calculate the area and perimeter of complex shapes.Students will explain their strategies for finding the area and perimeter of complex shapes.
Lesson 5	5-5 Growing Dimensions	Array - Multiplicative Comparison - Square Units	<ul style="list-style-type: none">Students use area and perimeter formulas to solve multiplicative comparison problems.

4-1 Marching Ants "Use Formula to Find Perimeter"

Learn

Using formula to find the perimeter of a rectangle

Problem

Omar is a farmer. His rectangular farm is 60 m long and 40 m wide.

He wants to install a fence all around his farm.

What is the length of the fence?



You can use a formula to find the perimeter of a rectangle. Where "P" stands for perimeter, "l" for length and "w" for width.



 Remember
Perimeter is the distance
around the figure

Shape	Perimeter	Formula
 $\begin{array}{c} l \\ \\ w \text{ [] } w \\ \\ l \end{array}$	$\text{Perimeter} = \text{length} + \text{width} + \text{length} + \text{width}$ or $\text{Perimeter} = 2 \times \text{length} + 2 \times \text{width}$ or $\text{Perimeter} = 2 \times (\text{length} + \text{width})$	$P = l + w + l + w$ or $P = [2 \times l] + [2 \times w]$ or $P = 2 \times (l + w)$

$$\text{So, the length of the fence} = \frac{60 + 40 + 60 + 40}{\downarrow \quad \downarrow} \quad [\text{Think : } P = l + w + l + w] \\ = 100 + 100 = 200 \text{ m}$$

$$\text{Or the length of the fence} = [2 \times 60] + [2 \times 40] \quad [\text{Think : } P = [2 \times l] + [2 \times w]] \\ = 120 + 80 = 200 \text{ m}$$

$$\text{Or the length of the fence} = 2 \times [60 + 40] \quad [\text{Think: } P = 2 \times (l+w)] \\ = 2 \times 100 = 200 \text{ m}$$

Notes for parents :

- Make sure your child understand that a formula is a kind of rule that tells how to solve a problem

Learn Using formula to find the perimeter of a square

All squares are rectangles. Square has 4 equal sides.

You can use a formula to find the perimeter of a square.

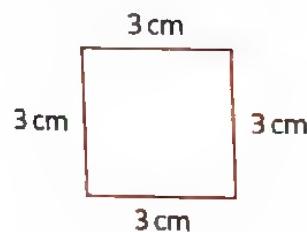
Where "P" stands for perimeter and "s" stands for side length.

Square	Perimeter	Formula
	$\text{Perimeter} = \text{side} + \text{side} + \text{side} + \text{side}$ or $\text{Perimeter} = 4 \times \text{side}$	$P = s + s + s + s$ or $P = 4 \times s$

For example :

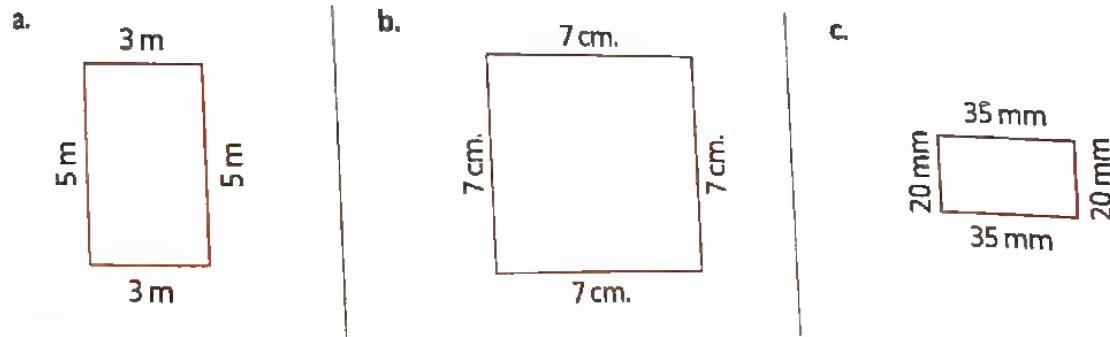
To find the perimeter of the opposite square use the formula

$$P = 4 \times s \quad \text{or} \quad P = s + s + s + s \\ = 4 \times 3 = 12 \text{ cm} \quad = 3 + 3 + 3 + 3 = 12 \text{ cm}$$



Example 1

Calculate the perimeters of the following shapes. Use different formulas to solve each problem.



Solution

a. • First formula : $P = [2 \times l] + [2 \times w] = [2 \times 5] + [2 \times 3] = 10 + 6 = 16 \text{ m}$

• Second formula : $P = 2 \times [l + w] = 2 \times [5 + 3] = 2 \times 8 = 16 \text{ m}$

b. • First formula : $P = s + s + s + s = 7 + 7 + 7 + 7 = 28 \text{ cm}$

• Second formula : $P = 4 \times s = 4 \times 7 = 28 \text{ cm}$

• Remind your child to take careful note of the measurement unit used in each problem

c. • First formula : $P = l + w + l + w = 35 + 20 + 35 + 20$
 $= 55 + 55 = 110 \text{ mm}$

• Second formula : $P = 2 \times (l + w) = 2 \times (20 + 35) = 2 \times 55 = 2 \times (50 + 5)$
 $= 100 + 10 = 110 \text{ mm}$

 Remember
You can use
distributive property
to multiply

Example 2

Ahmed wants to make a rectangular carpet of perimeter 12 m.

Draw different rectangles that could represent his carpet.



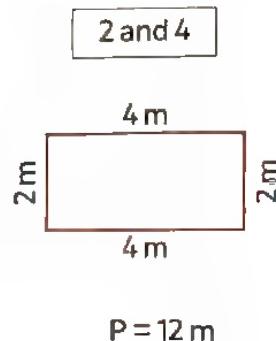
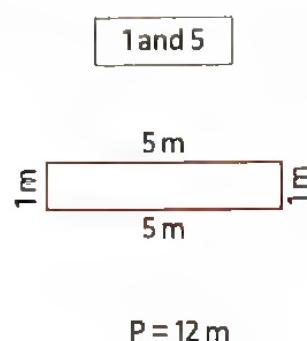
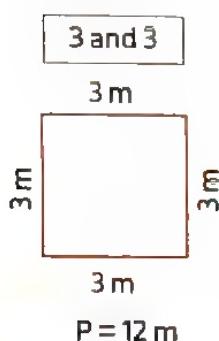
Solution

To find different rectangles of perimeter 12 m, do as follow :

- Find half of perimeter [half of perimeter = $l + w$]

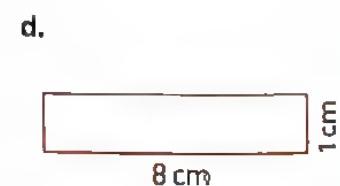
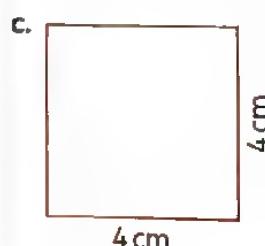
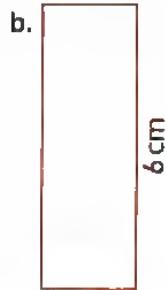
$$l + w = 12 \div 2 = 6 \text{ m}$$

- Find two numbers their sum is 6 , these two numbers are length and width of the required rectangle



Check your understanding

Which of the figures below have the same perimeter ?



Notes for parents :

- Review the distributive property using numbers rather than measurements

Exercise

21

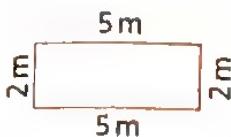
4-1 Marching Ants

"Use Formula to Find Perimeter"

REMEMBER**ENGLISH****APPLY****PROBLEM SOLVING****From the school book**

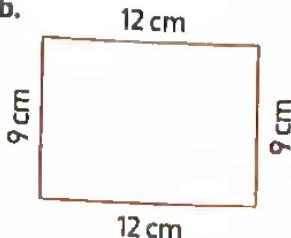
1. Use the formula $P = l + w + l + w$ to calculate the perimeters of the following rectangles.

a.



$$P = \underline{\hspace{2cm}}$$

b.



$$P = \underline{\hspace{2cm}}$$

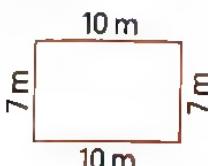
c.



$$P = \underline{\hspace{2cm}}$$

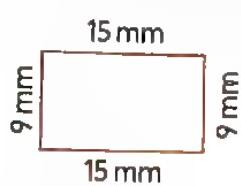
2. Use the formula $P = (2 \times l) + (2 \times w)$ to calculate the perimeter of each of the following rectangles.

a.



$$P = \underline{\hspace{2cm}}$$

b.



$$P = \underline{\hspace{2cm}}$$

c.



$$P = \underline{\hspace{2cm}}$$

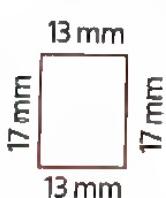
3. Use the formula $P = 2 \times (l + w)$ to calculate the perimeter of each of the following rectangles.

a.



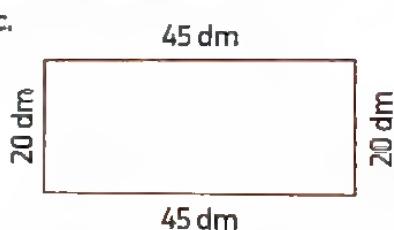
$$P = \underline{\hspace{2cm}}$$

b.



$$P = \underline{\hspace{2cm}}$$

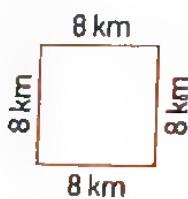
c.



$$P = \underline{\hspace{2cm}}$$

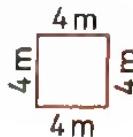
4. Use the formula $P = 4 \times s$ to calculate the perimeter of each of the following squares.

a.



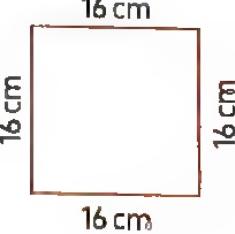
$$P = \underline{\hspace{2cm}}$$

b.



$$P = \underline{\hspace{2cm}}$$

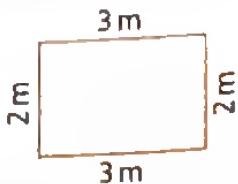
c.



$$P = \underline{\hspace{2cm}}$$

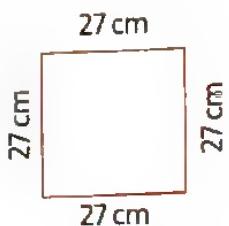
5. Calculate the perimeter of the shapes that follow. Use two different formulas to solve each problem. Show your work.

a.



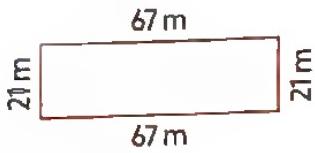
- First formula: _____
- Second formula: _____

c.



- First formula: _____
- Second formula: _____

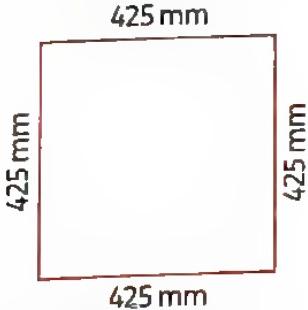
e.



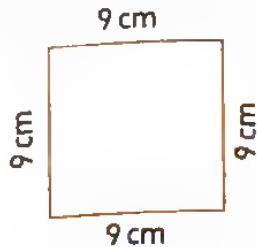
- First formula: _____
- Second formula: _____

6. Find the perimeter. Show your work.

a.

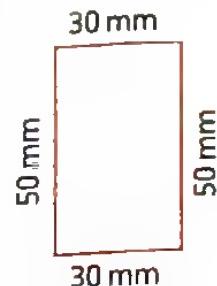


b.



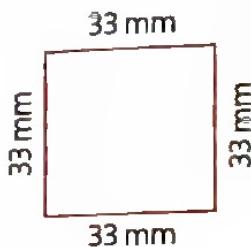
- First formula: _____
- Second formula: _____

d.



- First formula: _____
- Second formula: _____

f.



- First formula: _____
- Second formula: _____

7. Fill in the blanks.

- a. A rectangle of 16 m length and 14 m width, its perimeter is
- b. A rectangle is 26 m long and 8 m width, its perimeter is
- c. The perimeter of a rectangle of 13 mm length and 5 mm width is
- d. A square of side length 8 cm, its perimeter is
- e. The perimeter of a square of side length 15 m is

8. Omar is building a rectangular fence around his garden. The length is 8 meters and the width is 6 meters. How many meters of fencing will he need to build?

9. Sarah is putting a border around the edge of a square cake. One side of the cake is 30 centimeters long. How long will the border of Sarah's cake be?

10. Sherif is building a square picture frame. Each side will be 36 millimeters long.
 What will the perimeter of the frame be?

11. A soccer team is roping off part of a field to play soccer. To have enough room for a large crowd, they need a space that is 105 meters long by 68 meters wide. How much rope will they need for this part of the field?

12. A carpenter ant walked a perimeter of 100 centimeters. Draw two different rectangles that could represent its walk.

Choose the correct answer.

1. The length of a rectangle is l. The width is w. What is the formula to show the perimeter P?
- A. $P = l \times w$
 - B. $P = l + w$
 - C. $P = [2 \times l] + [2 \times w]$
 - D. $P = [2 \times l] + w$

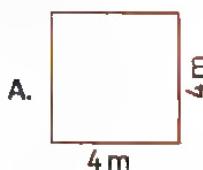
2. Which two choices show the formula for the perimeter of a rectangle?
- (P = perimeter, l = Length, w = Width)
 - A. $P = 2 \times (l + w)$
 - B. $P = 4 \times l$
 - C. $P = l + w + l + w$
 - D. $P = [2 \times l] \times [2 \times w]$

3. Which choice shows the formula for the perimeter of a square?
- [P = perimeter, s = side length]
- A. $P = 4 + s$
 - B. $P = 4 \times s$
 - C. $P = s \times s$
 - D. $P = s + s$

4. The perimeter of the opposite rectangle equals _____
- A. 10 m
 - B. 20 m
 - C. 14 m
 - D. 14 cm



5. Which of the following has the same perimeter of this rectangle?



6. Which rectangles have a perimeter of 12 meters? Select two correct answers.

- A. Rectangle A: 2 meters wide and 2 times as long.
- B. Rectangle B: 1 meter wide and 5 times as long.
- C. Rectangle C: 3 meters wide and 4 times as long.
- D. Rectangle D: 4 meters wide and 3 times as long.
- E. Rectangle E: 2 meters wide and 6 times as long.

7. Amal wants to find the perimeter of this rectangle.

- How can she calculate its perimeter?

- A. She can add $12 + 4 + 12 + 4$ to find the perimeter is 32 meters.
- B. She can add $12 + 4$ to find the perimeter is 16 meters.
- C. She can multiply $12 \times 4 \times 12 \times 4$ to find the perimeter is 2,304 meters.
- D. She can multiply 12×4 to find the perimeter is 48 meters.

12 m



4-2 Fill the Space

"Use Formula to Find Area"

Learn Using formula to find area of a rectangle

Sameh tiled the rectangular floor in his front hall.

He used square tiles that measure 1 meter on each side.

How many tiles did he use?

One Way

You can count square units to find the area.

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24



Remember

Area is the number of square units needed to cover the surface of a figure.

Record your answer in square units.

A = 24 square meters.

Another Way

You can also use a formula.

The formula for the area of a rectangle is

$$\text{Area} = \text{length} \times \text{width} \quad \text{Or} \quad A = l \times w$$

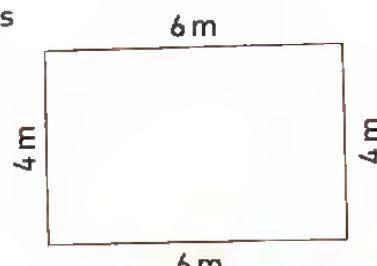
Use the formula to find the area.

$$A = l \times w$$

$$A = 6 \times 4$$

$$A = 24 \text{ square meters}$$

So, Sameh used 24 tiles.



Math tip

You can write square meters as m^2

, and write square centimeters as cm^2



Notes for parents :

-Ask your child to find area of a carpet in his/her room using a formula.

Learn Using a formula to find area of a square

The formula for the area of a square is

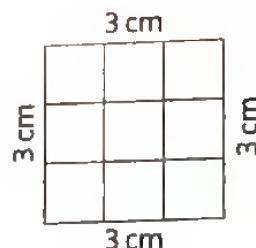
$$\text{Area} = \text{side length} \times \text{itself} \quad \text{Or} \quad A = s \times s$$

For example :

The area of the opposite square

$$A = s \times s = 3 \times 3$$

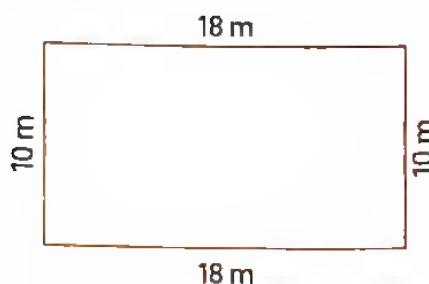
$$= 9 \text{ square centimeters } (\text{cm}^2)$$



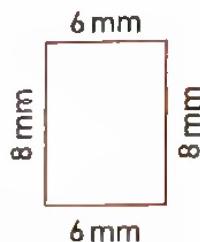
Example 1

Find the area of each of the following.

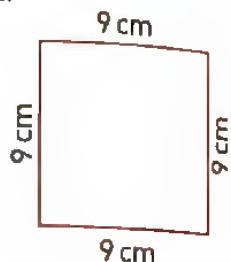
a.



b.



c.



Solution

a. $A = l \times w = 18 \times 10 = 180 \text{ m}^2$

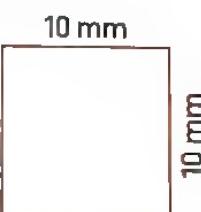
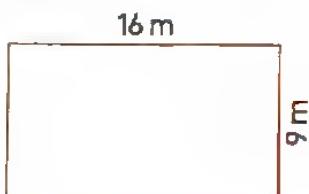
b. $A = l \times w = 8 \times 6 = 48 \text{ mm}^2$

c. $A = s \times s = 9 \times 9 = 81 \text{ cm}^2$

Example 2

Find the area and perimeter of each figure.

a.



Remember

- Perimeter : Measurement of the distance *around* the shape.
- Area : Measurement of the space *inside* the shape.

Notes for parents :

- Ask your child to use a different formula to calculate the area of any rectangle in this page

Solution

$$\text{a. } A = l \times w = 9 \times 16 = 9 \times [10 + 6] = 90 + 54 = 144 \text{ m}^2$$

$$P = 2 \times (l + w) = 2 \times (9 + 16) = 2 \times 25$$

$$= 2 \times [20 + 5] = 40 + 10 = 50 \text{ m}$$

$$\text{b. } A = s \times s = 10 \times 10 = 100 \text{ mm}^2$$

$$P = 4 \times s = 4 \times 10 = 40 \text{ mm}$$

Example 3

A small fish farm in the shape of a rectangle. Its dimensions are 10 meters and 8 meters. What is the area of the fish farm?

Solution

$$A = l \times w = 10 \times 8 = 80 \text{ m}^2$$

Example 4

The area of a piece of paper in the shape of a rectangle is 12 square meters.

What is the perimeter of this piece? Draw your answer and write the dimensions.

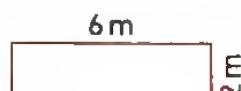
Solution

You need to find two numbers their product is 12, these two numbers are the rectangle dimensions

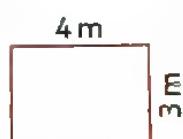
1 m and 12 m



2 m and 6 m



3 m and 4 m



$$P = l + w + l + w$$

$$= 1 + 12 + 1 + 12$$

$$= 13 + 13 = 26 \text{ m}$$

$$P = [2 \times l] + [2 \times w]$$

$$= [2 \times 6] + [2 \times 2]$$

$$= 12 + 4 = 16 \text{ m}$$

$$P = 2 \times (l + w)$$

$$= 2 \times (4 + 3)$$

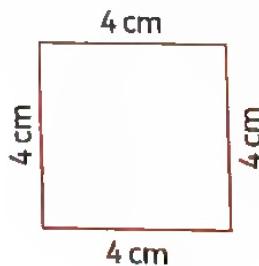
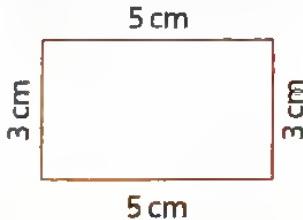
$$= 2 \times 7 = 14 \text{ m}$$

You can use different formulas to calculate the perimeter of a rectangle.



Check your understanding

► Circle the shape that has greater area.



- Challenge your child to draw many rectangles with area 30 cm².

**Exercise
22**

**4-2 Fill the Space
"Use Formula to Find Area"**

From the school book

REMEMBER

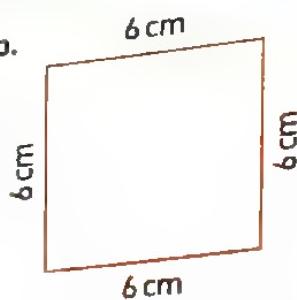
PROBLEM SOLVING

1. Write the formula of the area of each rectangle or square, then find its area.

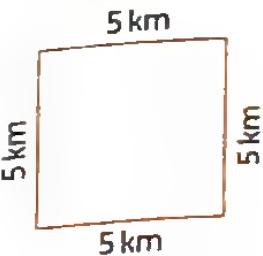
a.



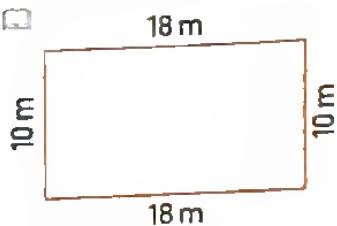
b.



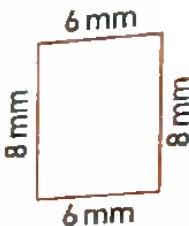
c.



d.



e.



f.



2. Find the area and perimeter of the rectangles and squares.

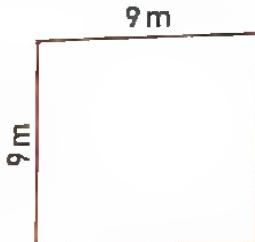
a.



$$\text{Area} = \underline{\hspace{2cm}}$$

$$\text{Perimeter} = \underline{\hspace{2cm}}$$

b.



$$\text{Area} = \underline{\hspace{2cm}}$$

$$\text{Perimeter} = \underline{\hspace{2cm}}$$

c.



$$\text{Area} = \underline{\hspace{2cm}}$$

$$\text{Perimeter} = \underline{\hspace{2cm}}$$

3. Complete each of the following.

- The area of a rectangle its dimensions are 5 cm and 3 cm is
- A rectangle is 7 km long and 6 km wide, its area equals
- The length of a rectangle is 10 mm and the width is 6 mm , then the area of this rectangle equals
- The area of a square of side length 8 m is
- A side length of a square is 10 cm, its area is

4. A glass company is cutting a piece of glass to cover the top of a banquet table. The table measures 8 meters by 6 meters. What is the area of the glass needed for the table ?

5. Andy is putting carpet in a room that measures 4 m by 5 m. How many square meters of carpet does he need ?

6. A small rectangular ant farm measures 20 centimeters by 8 centimeters. What is the area of the ant farm ?

7. For a science project, two students are creating an ant farm enclosure. Their enclosure will be 5 meters long and 2 meters wide. Sketch the enclosure and label the dimensions. Then, find the perimeter and area.

8. Sketch two rectangles, the area of each one is 20 cm^2 . Find the perimeter of each.

• First

$$P =$$

• Second

$$P =$$

9. You have 36 square carpet tiles to arrange on the floor in the shape of a rectangle. Draw two possible arrangements and label the length and width. What is the perimeter of each arrangement? What is the area?

• First

$$A =$$

$$P =$$

• Second

$$A =$$

$$P =$$

10. The area of a rectangular bakery is 30 square meters.
 ○ What could the perimeter be? Sketch your answer and label the dimensions.



Challenge

11. Ganat wants to create a long piece of artwork and needs two sheets of paper to do it.
 ○ Each piece of paper is 6 meters long and 2 meters wide and will be connected so two short edges touch. When she finishes the art, she has to decide whether to frame it or to hang it and cover it with glass. Ganat needs to know the measurements of the frame and the glass to make her decision.
- What is the measurement of the frame? Should you calculate area or perimeter to find that measurement?
 - What is the measurement of the glass? Should you calculate area or perimeter to find that measurement?

choose the correct answer.

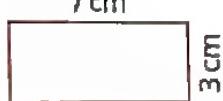
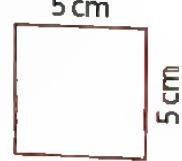
1. The length of a rectangle is b. The width is c. What is the calculation for the area?
- A. $b + c$
 - B. $b \times c$
 - C. $[2 \times b] + [2 \times c]$
 - D. $[2 \times b] \times [2 \times c]$

3. Walid has a rectangular garden that is 5 meters long and 4 times as wide. What is the area of Walid's garden?
- A. 9 square meters.
 - B. 50 square meters.
 - C. 20 square meters.
 - D. 100 square meters.

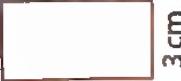
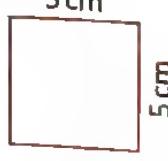
5. Eva needs to calculate the area of her room in order to buy new flooring. The room has the shape of a rectangle with a length of 10 meters and a width of 5 meters. How should Eva calculate the area of the room?
- A. Multiply 10 and 5
 - B. Divide 10 by 5
 - C. Subtract 5 from 10
 - D. Add 5 and 10

6. A rectangular garden is 5 meters wide and 7 meters long. What is the area of the garden?
- A. $[2 \times 5] + [2 \times 7] = 24$ square meters.
 - B. $[7 \times 5] + [7 \times 5] = 70$ square meters.
 - C. $7 \times 5 = 35$ square meters.
 - D. $7 + 5 = 12$ square meters.

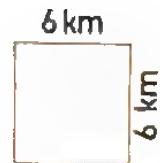
7. Which two choice has the same perimeter but different in area?

- A. 
- B. 
- C. 
- D. 

8. Which two choice has the same area but different in perimeter?

- A. 
- B. 
- C. 
- D. 

2. The area of the opposite figure equal
- A. 24 km
 - B. 36 km
 - C. 36 km²
 - D. 24 km²



4. The area of a piece of paper in the shape of a square with side length 8 cm equal
- cm²
 - A. 64
 - B. 16
 - C. 32
 - D. 80

4-3 Something Is Missing!

Learn

Use formulas to calculate the unknown dimension of a rectangle

1. How to find the unknown dimension of a rectangle given its area

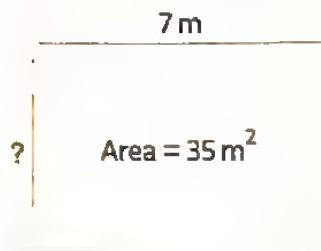
Amal made a rectangular flower garden with an area of 35 square meters and its length is 7 meters.

How long is its width?



Remember

Area of a rectangle = length × width



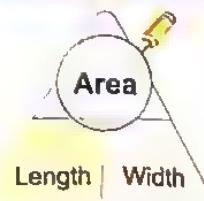
Use the formula to find the unknown width (w).

$$A = l \times w$$

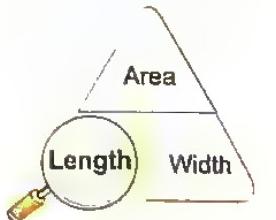
$$w = A \div l$$

$$w = 35 \div 7 = 5 \text{ m.}$$

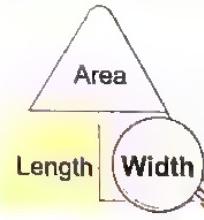
So, the width of the garden is 5 meters.



$$\boxed{\text{Area} = \text{Length} \times \text{Width}}$$



$$\boxed{\text{Length} = \text{Area} \div \text{Width}}$$



$$\boxed{\text{Width} = \text{Area} \div \text{Length}}$$

Notes for parents :

- In this lesson, your child will apply area and perimeter formulas to solve for an unknown dimension in a rectangle or a square.

2. How to find the unknown dimension of a rectangle given its perimeter

A rectangular piece of paper has a perimeter 28 cm and width 6 cm.

How long is its length ?

?



Remember

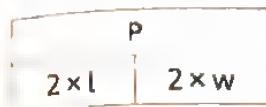
perimeter of a rectangle = $(2 \times \text{length}) + (2 \times \text{width})$

Perimeter = 28 cm 6 cm

- Use the formula to find the unknown length (l).

$$P = [2 \times l] + [2 \times w]$$

- Use the bar model



[Think : $2 \times w = 2 \times 6 = 12$]



$$2 \times l = 28 - 12$$

$$2 \times l = 16$$

$$l = 16 \div 2 = 8 \text{ cm}$$

So, the length is 8 cm.

Another Way

- width = half of perimeter – length
- length = half of perimeter – width
- Half of perimeter = $28 \div 2 = 14$
- Length = $14 - 6 = 8 \text{ cm}$

Conclusion

In a rectangle

l = length , w = width , P = perimeter , A = area

$$A = l \times w$$

$$P = 2 \times (l + w)$$

$$\bullet l = A \div w$$

$$\bullet l = (P \div 2) - w$$

$$\bullet w = A \div l$$

$$\bullet w = (P \div 2) - l$$

Example 1

- The area of a rectangle is 28 cm^2 . If its width equals 4 cm, find its length and its perimeter.
- The perimeter of a rectangle is 20 m. If its length equals 6 m, find its width and its area.

Solution

a. $A = 28 \text{ cm}^2$ $w = 4 \text{ cm}$ $l = ?$

$$\begin{aligned} \bullet l &= A \div w \\ &= 28 \div 4 = 7 \text{ cm} \\ \bullet P &= 2 \times (l + w) \\ &= 2 \times (7 + 4) \\ &= 2 \times 11 = 22 \text{ cm}. \end{aligned}$$

b. $P = 20 \text{ m}$ $l = 6$ $w = ?$

$$\begin{aligned} P \div 2 &= 20 \div 2 = 10 \text{ m} \\ \bullet w &= (P \div 2) - l = 10 - 6 = 4 \text{ m} \\ \bullet A &= l \times w = 6 \times 4 = 24 \text{ m}^2 \end{aligned}$$

* Remind your child of the formulas of perimeter of a rectangle. [$P = (2 \times l) + (2 \times w)$, $P = 2 \times (l + w)$].

Learn

Use formulas to calculate the side length of a square

1. How to find the side length of a square given its area

A square is of area 36 cm².

What is its side length?



Remember

Area of a square = side length × side length

- Use the formula to find the unknown side length

$$A = s \times s$$

$$36 = s \times s$$

$$s = 6 \text{ cm} \text{ (because } 6 \times 6 = 36\text{)}$$

Hint

Look for a number if multiplied by itself gives the area.

2. How to find the side length of a square given its perimeter

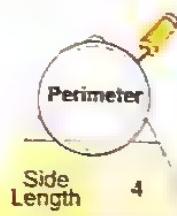
A square is of perimeter 36 cm.

What is its side length?



Remember

Perimeter of a square = side length × 4



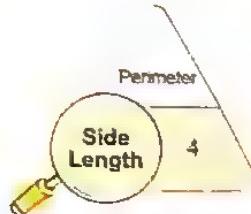
$$\text{Perimeter} = \text{Side length} \times 4$$

- Use the formula to find the unknown side length (s)

$$P = s \times 4$$

$$36 = s \times 4$$

$$s = 36 \div 4 = 9 \text{ cm}$$



$$\text{Side length} = \text{Perimeter} \div 4$$

Notes for parents :

- Ask your child questions as . Which number if multiplied by itself you get 16 , 25 , 36 , 49 , ... ?

Conclusion

In a square

s = side length , P = perimeter , A = area

$$A = s \times s$$

s is a number if multiplied by itself gives area

$$P = s \times 4$$

$$s = P \div 4$$



Example 2

- a. A square is of area 16 m^2 . Find its side length and its perimeter.
- b. A square is of perimeter 32 cm . Find its side length and its area.

Solution

a. $A = 16 \text{ m}^2$ $s = ?$

- $s = 4 \text{ m}$ (because $4 \times 4 = 16$)
- $P = 4 \times s = 4 \times 4 = 16 \text{ m}$

b. $P = 32 \text{ cm}$ $s = ?$

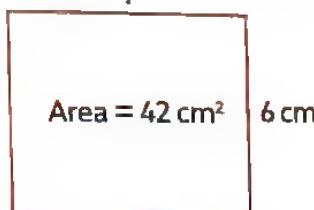
- $s = P \div 4 = 32 \div 4 = 8 \text{ cm}$
- $A = s \times s = 8 \times 8 = 64 \text{ cm}^2$



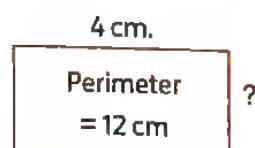
Check your understanding

► Find the unknown length in each of the following rectangles or squares.

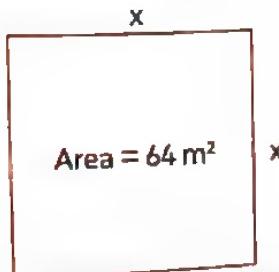
a.



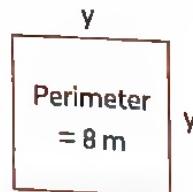
b.



c.



d.



• Revise with your child time table 4. Practise him/her how he/she can divide by 4.

**Exercise
23**

4-3 Something Is Missing!

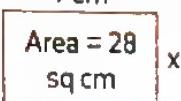
REMEMBER

APPLY

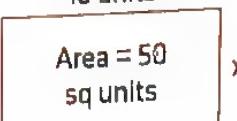
PROBLEM SOLVING

From the school book

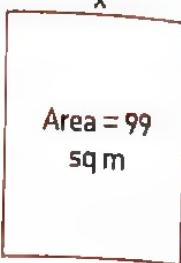
1. Find the unknown side length based on the area given of each rectangle.

a. 

$$\begin{array}{l} 7 \text{ cm} \\ \boxed{\text{Area} = 28 \text{ sq cm}} \\ x \end{array}$$

b. 

$$\begin{array}{l} 10 \text{ units} \\ \boxed{\text{Area} = 50 \text{ sq units}} \\ x \end{array}$$

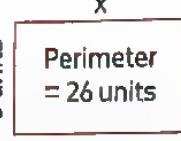
c. 

$$\begin{array}{l} x \\ \boxed{\text{Area} = 99 \text{ sq m}} \\ 11 \text{ m} \end{array}$$

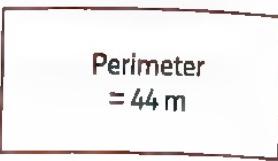
2. Find the unknown side length based on the perimeter given of each rectangle.

a.

$$\begin{array}{l} \boxed{\text{Perimeter} = 24 \text{ cm}} \\ 8 \text{ cm} \\ x \end{array}$$

b. 

$$\begin{array}{l} 5 \text{ units} \\ \boxed{\text{Perimeter} = 26 \text{ units}} \\ x \end{array}$$

c. 

$$\begin{array}{l} 15 \text{ m} \\ \boxed{\text{Perimeter} = 44 \text{ m}} \\ x \end{array}$$

3. Find the unknown side length based on the area given of each square.

a.

$$\begin{array}{l} y \\ \boxed{\text{Area} = 25 \text{ m}^2} \end{array}$$

b.

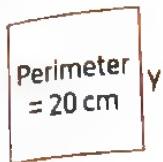
$$\begin{array}{l} \boxed{\text{Area} = 49 \text{ cm}^2} \\ y \end{array}$$

c.

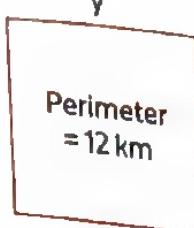
$$\begin{array}{l} \boxed{\text{Area} = 100 \text{ cm}^2} \\ y \end{array}$$

4. Find the unknown side length based on the perimeter given of each square.

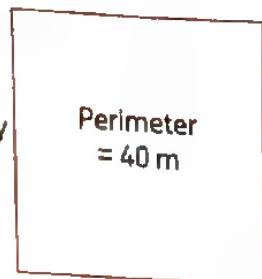
a.



b.



c.



5. Complete the following table of rectangles.

d.

Length	Width	Area	Perimeter
a. 5 cm	10 cm	_____	_____
b. _____	5 m	10 m ²	_____
c. 9 km	_____	72 km ²	_____
d. 6 dm	_____	_____	22 dm
e. _____	2 mm	_____	18 mm

6. Complete the following table of squares.

e.

Side length	Area	Perimeter
a. 9 m	_____	_____
b. _____	64 cm ²	_____
c. _____	_____	36 mm

7. Complete each of the following.

- a. A square is of area 49 km^2 , then its side length is _____
- b. A square has a perimeter 12 cm, then its area is _____
- c. A square has an area 9 m^2 , then its perimeter is _____
- d. The area of a rectangle is 42 km^2 , and its width is 6 km, then its length is _____
- e. The area of a rectangle is 45 m^2 , and its length is 9 m, then its perimeter is _____
- f. A rectangle is of perimeter 26 cm, and its width is 4 cm, then its length is _____
- g. A rectangle is of perimeter 32 m, and its length is 9 m, then its area is _____

8. A rectangular flowerbed in the city park has an area of 12 square meters. The width of the flowerbed is 3 meters. What is the length of the flowerbed?

9. Ali sketch a rectangular painting with an area of 28 cm^2 , the width of his painting is 4 cm
 Find its perimeter.

10. Tahani is building a square picture frame for her father. The picture she has to frame has an area of 144 square centimeters. What is the width and the length of her frame? Sketch the frame and show your work.

11. Emad is building a pen with 26 m of fencing.
 What is the length and the area of it if its width is 6 m?

12. Mai walked once around the squared playground. She covered a distance of 40 m.
 What is the area of this playground?

13. Soliman works on a farm. The fence for the goats fell down, and his uncle asked Soliman to get more wire to make a new fence. He was told that the width of the fence is 25 meters and that he needs to get 110 meters of wire to go around the entire space. What is the length of the missing side? Sketch the fence and find the missing length.

14. A rectangle is 6 meters wide. The length is 2 meters more than its width. What is the area and perimeter of the rectangle?

Challenge

15. Mathew has two pictures, both with an area of 36 cm^2 . One is a rectangle with length 9 cm, and the other is a square. Which has the greater perimeter?

Multiple Choice Questions

Choose the correct answer.

1. Length of a rectangle =

- A. Area ÷ length
- B. Area ÷ width
- C. Length × width
- D. Area × width

3. A square with a perimeter 32 cm, then the side length of the square equals _____

- A. 8 cm
- B. 4 cm
- C. 16 cm
- D. 64 cm

5. The value of y is _____

- A. 4 cm
- B. 6 cm
- C. 10 cm
- D. 8 cm

6. A rectangle with area 15 cm^2 and width 3 cm.

What is its perimeter?

- A. 8 cm
- B. 15 cm
- C. 16 cm
- D. 16 cm^2

8. Nancy's rectangular room is 8 meters

long and has a perimeter of 24 meters.
What is the width of the room?

- A. 16 meters
- B. 3 meters
- C. 8 meters
- D. 4 meters

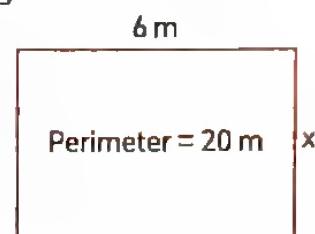
2. A rectangle with an area 30 cm^2 . If its length

is 6 cm, then its width equals

- A. 6 cm
- B. 5 m
- C. 5 cm
- D. 30 cm

4. The value of x is

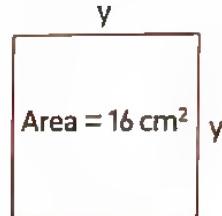
- A. 10 m
- B. 20 m
- C. 6 m
- D. 4 m



7. A square with area 1 m^2

What is its perimeter?

- A. 1 m
- B. 2 m
- C. 3 m
- D. 4 m



9. Elen wants to find the measure of the length of a rectangle with area 18 cm^2 and width 3 cm. How can she find the length?

- A. She can add $18 + 3 + 18 + 3$
- B. She can multiply 18×3
- C. She can divide $18 \div 3$
- D. She can add $18 + 3$

4-4 Odd Shapes

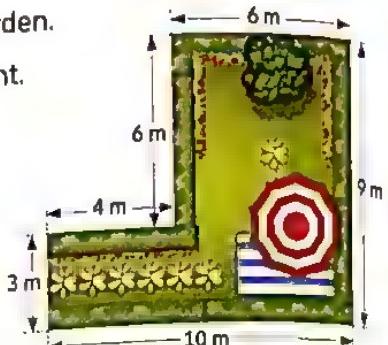
Learn How to find perimeter and area of complex figures

Andy wants to put a fence around his garden.

The space he will use is shown at the right.

How much fence should he buy ?

What is the area of his garden ?



Find the perimeter

Add the lengths of the sides.

$$\text{Perimeter} = 10 + 3 + 4 + 6 + 6 + 9 = 38 \text{ m}$$

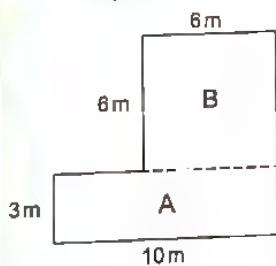
He should buy 38 meters of fence.

Find the area

There are many ways to calculate the area.

Step 1

Separate the figure into a rectangle A and a square B.



Step 2

Calculate to find the area of each figure.

Area of the rectangle A

$$\begin{aligned}A &= l \times w \\&= 10 \times 3 \\&= 30 \text{ sq m}\end{aligned}$$

Area of the square B

$$\begin{aligned}A &= s \times s \\&= 6 \times 6 = 36 \text{ sq m}\end{aligned}$$

Step 3

Add both areas to find the area of the whole figure.

$$30 + 36 = 66 \text{ sq m}$$

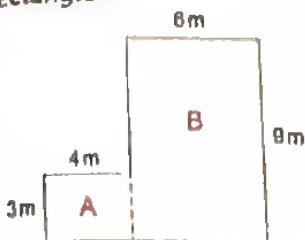
The area of the garden is 66 square meters.

Notes for parents :

- In this lesson, your child will learn and apply strategies for calculating the area and perimeter of complex shapes. Your child will use a variety of strategies to break shapes down into squares and rectangles to calculate their measurements.

Another Way to find area**Step 1**

Separate the figure into a rectangle A and a rectangle B

**Step 2**

Calculate to find the area of each figure.

Area of the rectangle A

$$\text{Area} = l \times w \\ = 4 \times 3 = 12 \text{ sq m}$$

Area of the rectangle B

$$\text{Area} = l \times w \\ = 9 \times 6 = 54 \text{ sq m}$$

Step 3

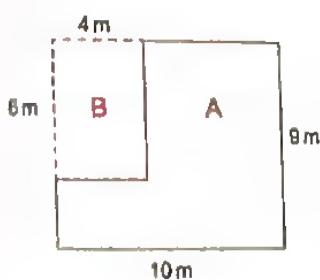
Add both areas to find the area of the whole figure.

$$12 + 54 = 66 \text{ sq m}$$

The area of the garden is 66 square meters.

Another Way to find area**Step 1**

Complete the figure as a big rectangle A and a small rectangle B

**Step 2**

Calculate to find the area of each figure.

Area of the rectangle A

$$\text{A} = l \times w \\ = 10 \times 9 = 90 \text{ sq m}$$

Area of the rectangle B

$$\text{A} = l \times w \\ = 6 \times 4 = 24 \text{ sq m}$$

Step 3

Subtract areas to find the area of the whole figure.

$$90 - 24 = 66 \text{ sq m}$$

The area of the garden is 66 square meters.

Note

The area of a complex figure does not change when divided in different ways.

- Make sure your child understand the area of a complex figure does not change when he/she calculate in different ways.

Example 1

Calculate the perimeter and area of the figure.

Solution

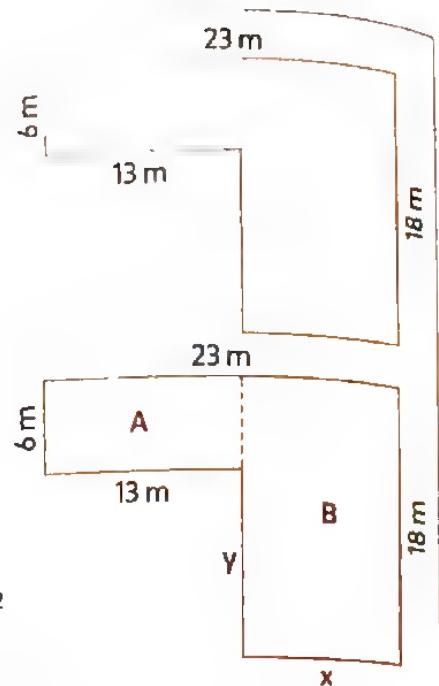
First you should find the length of the unknown sides x and y

$$x = 23 - 13 = 10 \text{ m} \quad y = 18 - 6 = 12 \text{ m}$$

$$\text{The perimeter} = 23 + 18 + 10 + 12 + 13 + 6 = 82 \text{ m}$$

The area = Area of section A + Area of section B

$$\begin{aligned} &= [13 \times 6] + [18 \times 10] \\ &= [10 + 3] \times 6 + 180 \\ &= [10 \times 6] + [3 \times 6] + 180 = 60 + 18 + 180 = 258 \text{ m}^2 \end{aligned}$$



Example 2

Combine these two simple shapes to form a complex shape.

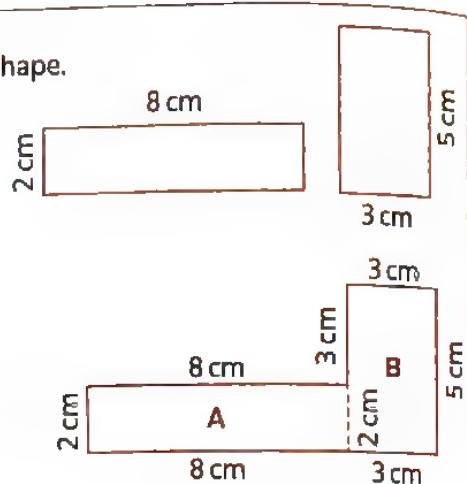
Sketch your shape, labeling the sides.

Then calculate the perimeter and the area of the complex shape.

Solution

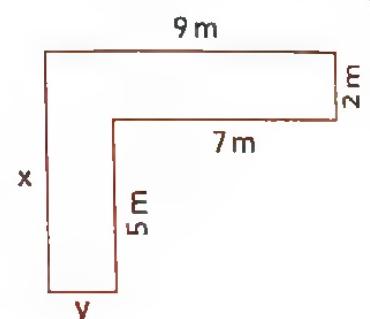
$$\bullet \text{The perimeter} = 8 + 3 + 3 + 5 + 3 + 8 + 2 = 32 \text{ cm}$$

$$\begin{aligned} \bullet \text{The area} &= \text{Area of section A} + \text{Area of section B} \\ &= [8 \times 2] + [5 \times 3] = 16 + 15 = 31 \text{ cm}^2 \end{aligned}$$



Check your understanding

Find the perimeter and the area of each of the complex figure.



Notes for parents :

- The perimeter of the complex shape may be equal different results according to how you form this complex shape, but the area of the complex shape do not change.

Exercise 24

4-4 Odd Shapes

REMEMBER

INTERVIEWS

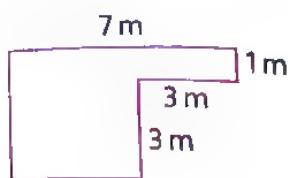
DATA

PROBLEM SOLVING

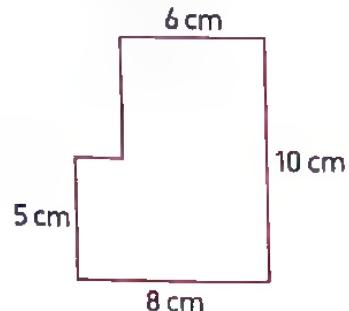
From the school book

1. Calculate the area and perimeter of the complex shapes. Show your work.

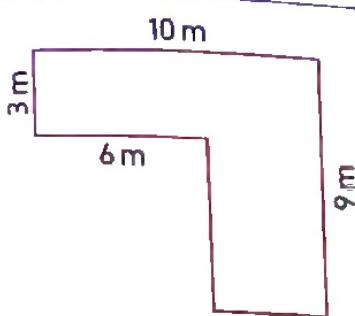
a.



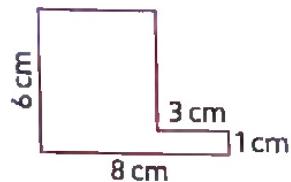
b.



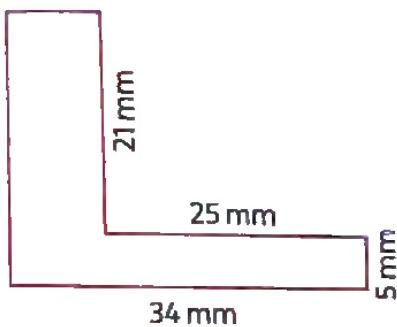
c.



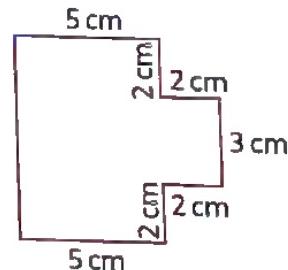
d.



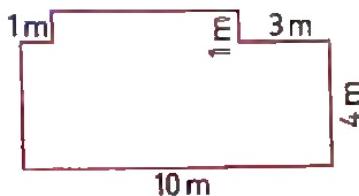
e.



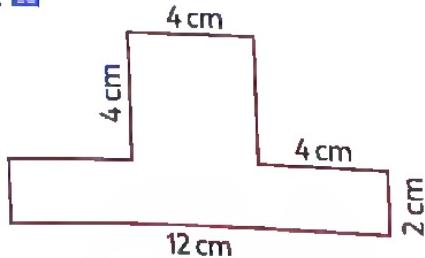
f.



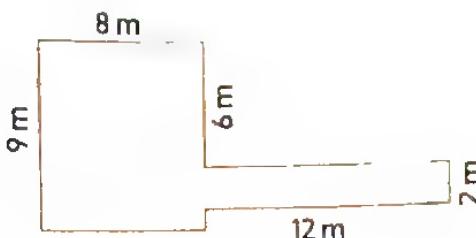
g.



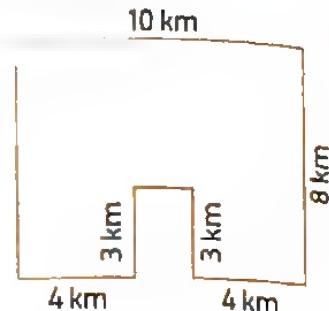
h.



i. (1)



j.



2. Combine these two simple shapes into a complex shape. Sketch your shape, labeling the sides.



Then, calculate the area and perimeter for the complex shape.

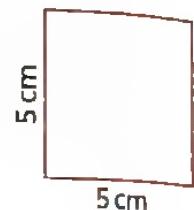
a. (1)



b.

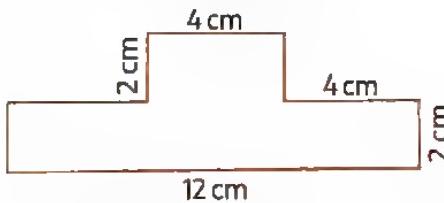


c.



Challenge

3. When Reem calculated the perimeter and area of this shape, she found that the perimeter was 36 centimeters and the area was 32 square centimeters. Only one of those measurements is accurate.

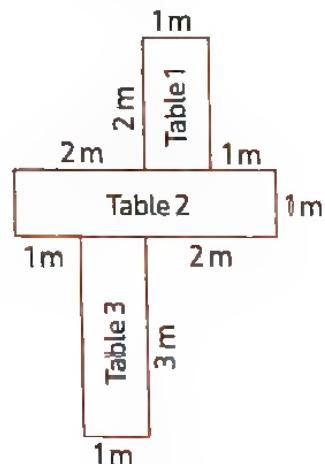


a. Which of Reem's measurement is accurate? Show how you know.

b. What is the correct answer for Reem's incorrect measurement? Show how you know.

c. Why do you think Reem made that error?

4. A company pushes together three tables for a team meeting. What is the area of the figure made by the tables? Explain how you know.

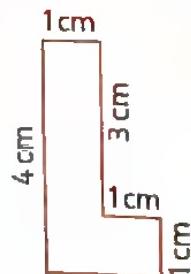


Multiple Choice Questions

Choose the correct answer.

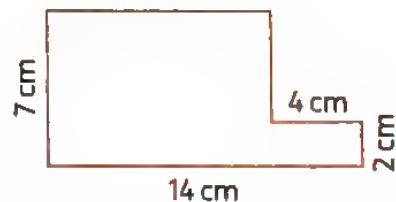
1. What is the perimeter of the figure?

- A. 10 cm
- B. 12 cm
- C. 13 cm
- D. 15 cm



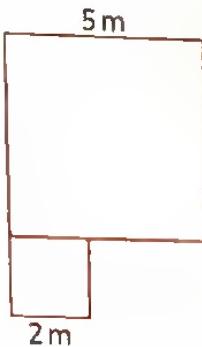
2. What is the area of the figure?

- A. 24 cm^2
- B. 42 cm^2
- C. 78 cm^2
- D. 87 cm^2



3. Two squares are joined to make a figure. What is the perimeter of the figure?

- A. 7 m
- B. 10 m
- C. 24 m
- D. 35 m



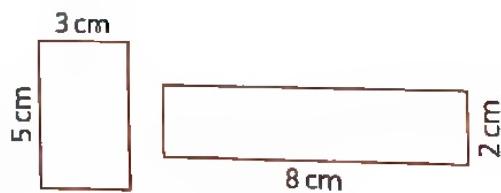
4. Two squares are joined to make a figure. What is the area of the figure?

- A. 5 cm^2
- B. 17 cm^2
- C. 18 cm^2
- D. 20 cm^2



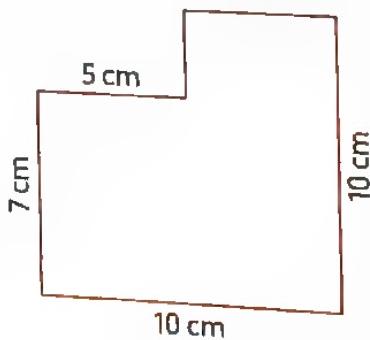
5. If you combine the two rectangles to make a complex figure, what is the area of the resulted figure?

- A. 18 cm^2
- B. 31 cm^2
- C. 36 cm^2
- D. 40 cm^2



6. Hani drew a sketch of his room to look like using centimeters as in the opposite figure, the perimeter of the sketch equal

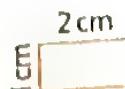
- A. the perimeter of a square of side length 12 cm
- B. the perimeter of a square of side length 10 cm
- C. the perimeter of a rectangle with 10 cm long and 5 cm wide.
- D. the perimeter of a rectangle with two dimensions 8 cm, 7 cm.



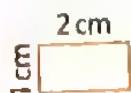
4-5 Growing Dimensions

Learn

Look at the rectangle

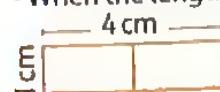


- What will happen to the area of the rectangle if the length is doubled and if tripled ?



$$\text{Area} = 2 \times 1 = 2 \text{ cm}^2$$

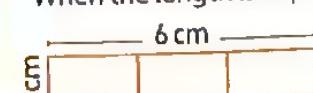
- When the length is doubled.



$$\text{Area} = 4 \times 1 = 4 \text{ cm}^2$$

The area doubles too.

- When the length is tripled.



$$\text{Area} = 6 \times 1 = 6 \text{ cm}^2$$

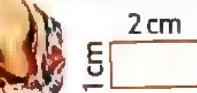
The area triples too.



Math tip

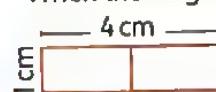
- Double means ($\times 2$)
- Triple means ($\times 3$)

- What will happen to the perimeter of the rectangle if the length is doubled and if tripled ?



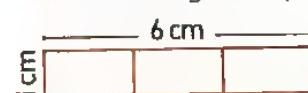
$$\text{Perimeter} = 2 \times [2 + 1] = 2 \times 3 = 6 \text{ cm}$$

- When the length is doubled.



$$\text{Perimeter} = 2 \times [4 + 1] = 2 \times 5 = 10 \text{ cm}$$

- When the length is tripled.



$$\text{Perimeter} = 2 \times [6 + 1] = 2 \times 7 = 14 \text{ cm}$$

You can use connected rectangles to form a perimeter pattern

6, 10, 14

A rule is add 4.

Notes for parents :

- In this lesson, your child will use area and perimeter formulas to solve multiplicative comparison problems.

Notes

- Double (Twice) means to multiply by 2
- Triple means to multiply by 3
- Two times means to multiply by 2
- Three times means to multiply by 3
- Four times means to multiply by 4
- Half means to divide by 2
- Third means to divide by 3

Examples

- Double the number 4 $\rightarrow 4 \times 2 = 8$
- Twice the number 5 $\rightarrow 5 \times 2 = 10$
- Triple the number 2 $\rightarrow 3 \times 2 = 6$
- Two times the number 10 $\rightarrow 2 \times 10 = 20$
- Three times the number 6 $\rightarrow 3 \times 6 = 18$
- Four times the number 9 $\rightarrow 4 \times 9 = 36$

Example 1

A rectangle with width 5 cm and its length is 4 times the width. Draw the rectangle and write the measure of its sides then find the area and perimeter.

Solution

$$\bullet w = 5 \text{ cm} \quad l = 4 \times 5 = 20 \text{ cm}$$

$$\bullet \text{Area} = l \times w$$

$$= 20 \times 5 = 100 \text{ cm}^2$$

$$\bullet \text{Perimeter} = 2 \times [l + w] = 2 \times [20 + 5] = 50 \text{ cm}$$

**Example 2**

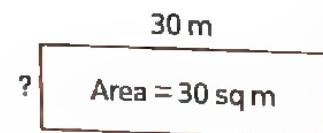
A rectangle is 30 square meters. The longer side of it is 10 meters. Another rectangle is three times as long and three times as wide as the first rectangle.

What is the perimeter of the second rectangle?

Solution

$$\bullet \text{First rectangle: } A = 30 \text{ m}^2 \quad l = 10 \text{ m} \quad w = ?$$

$$w = A \div l = 30 \div 10 = 3 \text{ m}$$



$$\bullet \text{Second rectangle: } l = 3 \times 10 = 30 \text{ m}$$

$$w = 3 \times 3 = 9 \text{ m}$$

$$\begin{aligned} \text{The perimeter of second rectangle} &= [2 \times l] + [2 \times w] \\ &= [2 \times 30] + [2 \times 9] \\ &= 60 + 18 = 78 \text{ m} \end{aligned}$$

- In a multiplicative comparison problems, one quantity will always be smaller or larger than the other quantity.

Example 3

In the opposite figure :

The length of the large rectangle is twice the length of the smaller rectangle. The width of the large rectangle is four times the length of smaller one.

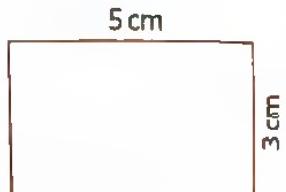
Find the area of colored part.

**Solution**

- The length of the large rectangle = $2 \times 5 = 10 \text{ cm}$
- The width of the large rectangle = $4 \times 2 = 8 \text{ cm}$
- Area of the large rectangle = $l \times w = 10 \times 8 = 80 \text{ cm}^2$
- Area of the smaller rectangle = $l \times w = 5 \times 2 = 10 \text{ cm}^2$
- Area of colored part = $80 - 10 = 70 \text{ cm}^2$

**check your understanding**

1. What is the area of this rectangle ?



2. What will happen to the area if the length is doubled ?

3. What will happen to the area if the length is tripled ?

4. What will happen to the area of the original rectangle if both the length and width are doubled ?

Notes for parents :

- Your child may start out feeling comfortable using additive comparisons instead of multiplicative "For example to find 4 times the number 2 use repeated addition $2 + 2 + 2 + 2 = 8$ "

**Exercise
25**

4-5 Growing Dimensions

REMEMBER

CONNECT

CARRY

PROBLEM SOLVING

From the school book

1. A rectangle is 5 centimeters wide. It is 4 times as long as its wide. Draw the rectangle, label the dimensions, and find its area and perimeter.

Area = _____

Perimeter = _____

2. Calculate the area and perimeter of a rectangle whose length is twice its width, if its width is 6 m.

Area = _____

Perimeter = _____

3. A length of a rectangle is 10 dm, find its area and perimeter if its width half its length

Area = _____

Perimeter = _____

4. Rectangle with 4 cm width and the length is triple its width. Find the area and the perimeter.

Area = _____

Perimeter = _____

5. Rectangle with 5 m width and its length is double the width. Find its perimeter and area.

6. Adam's rectangular garden is 20 square meters. The longer side of the garden is 5 meters.

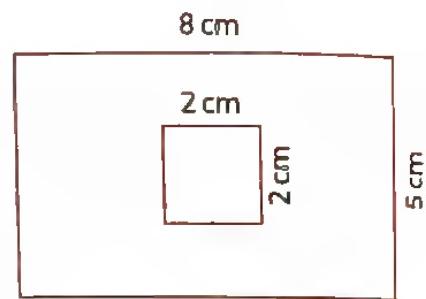
Sketch a drawing of Adam's garden. Dalia's garden is three times as long and three times as wide as Adam's rectangular garden. What is the perimeter of Dalia's garden ?

7. L.) The area of Mohamed's basketball court at home is 15 square meters. The longer side is 5 meters. Sketch a drawing of Mohamed's basketball court. The basketball court he plays in at the park is two times as long and two times as wide. Find the perimeter and area for both basketball courts.

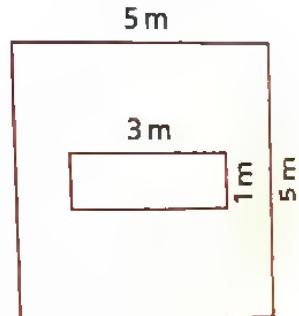
8. M.) Mariam painted a mural for the school with an area of 24 square meters and a length of 8 meters. What is the width of her mural? Her next mural will be the same length as the first but three times as wide. What is the perimeter of her next mural? What is the area?

9. Calculate the area of the shaded part of the figure.

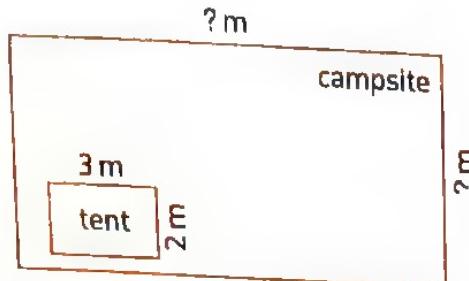
a.



b.



10. Rami and Salah went on a camping trip. The diagram of their campsite is shown. If the length of the campsite is six times the length of the tent and the width of the campsite is three times the width of the tent, how much room will they have left to set up the rest of their camping gear?



11. Worker ants from three different colonies are in search of food.

They use pheromones to lay a scent trail, and follow each other in a line around picnic blankets.

- Colony A's ants walk around a blanket that is 2 meters wide and has an area of 12 square meters.
- Colony B's blanket is twice as wide as Colony A's blanket (but the same length).
- Colony C's blanket is three times as wide as Colony A's blanket (but the same length).

Draw and label a picture to represent each blanket. Find the area and perimeter for each blanket.

Challenge

12. The length of a rectangle is three times its width. If its perimeter is 40 cm. Find its area.

Multiplication

Choose the correct answer.

1. If a rectangle of width 5 cm and its length is twice the width, then its area = ____ cm²
- A. 15 B. 50 C. 25 D. 100

2. If a rectangle of width 3 m and its length is four times its width, then its perimeter = ____ m
- A. 14 B. 7 C. 30 D. 36

3. A rectangle with width 4 cm. If its length is three times of the width, then the length of the rectangle = ____ cm
- A. 7 B. 8 C. 4 D. 12

4. The area of the shaded part of the figure equal ____ cm²
- A. 16 B. 44 C. 50 D. 6
-

5. A rectangle with length 10 cm and if its width is half the length, then the width = ____ cm
- A. 10 B. 15 C. 5 D. 2

6. The perimeter of a square is 2 times the perimeter of a rectangle whose dimensions 6 cm and 4 cm. What is the side length of the square ?
- A. 10 cm B. 20 cm C. 40 cm D. 80 cm

7. A rectangle with length x cm and width 5 cm if another rectangle with the same length but its width is twice the width of the first one, then

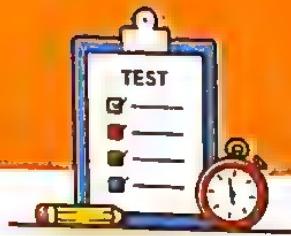
- a. The formula of area of the second rectangle is _____

A. $A = x \times 5$ B. $A = x + 10$ C. $A = x \times 10$ D. $A = 2x \times 10$

- b. The formula of perimeter of the second rectangle is _____

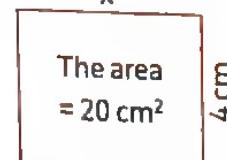
A. $P = 2x(x+5)$ B. $P = 2 \times (2x+5)$ C. $P = 2 \times (x+10)$ D. $P = 4 \times 5$

Unit Four Assessment



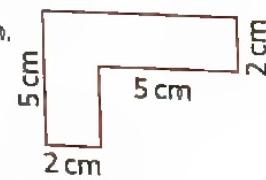
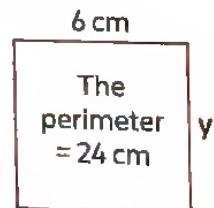
1. put (✓) to the correct answer and (✗) to the incorrect answer.

- a. The formula of the perimeter of the rectangle is $P = 2l + 2w$ []
- b. The area of a square of side length 5 cm equals 25 cm. []
- c. In the opposite figure:
The value of x is 5 cm. []
- d. The perimeter of the opposite figure
equals perimeter of A + perimeter of B. []
- e. The area of the rectangle does not change if its length increases 4 times. []
- f. Width of the rectangle = its area ÷ its length. []



2. Choose the correct answer.

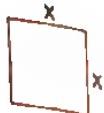
- a. The area of the rectangle with 5 cm long and 3 cm wide equals _____
 A. 16 cm^2 B. 15 cm C. 15 cm^2 D. 16 cm
- b. In the opposite figure:
The value of y is _____
 A. 4 cm B. 5 cm C. 6 cm D. 7 cm
- c. The perimeter of the opposite complex figure equals _____ cm.
 A. 14 B. 21 C. 19 D. 24
- d. A rectangle with width 5 cm and if its length is twice the width, then its area
 = _____ cm^2
 A. 25 B. 50 C. 30 D. 40
- e. Area of square = _____
 A. $2l + 2w$ B. $l + w$ C. $l \times w$ D. $s \times 4$
- f. The perimeter of a square of side length 10 m is _____ m.
 A. 30 B. 100 C. 20 D. 40



3. Complete the following.

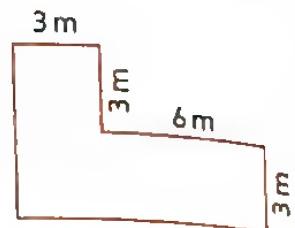
a. If the area of the opposite figure equals 25 m^2 , then

the value of x is m



b. The area of the opposite

figure equals m^2



c. A rectangle with width 3 cm. if its length is 3 times the width, then the area of this rectangle = cm^2

d. The perimeter of the rectangle = $\text{ } + \text{ }$

e. The area of a rectangle with 8 cm long and 2 cm wide equals the area of a square of side length cm

f. The side length of a square = its perimeter \div

4. Match the cards that have the same results.

a. The area of a square of side length 6 cm

1. 20 cm

b. The perimeter of a rectangle with 6 cm long and 4 cm wide

2. 36 cm^2

c. The perimeter of a square of side length 10 cm

3. 18 cm^2

d. The area of a rectangle with two dimensions 6 cm and 3 cm

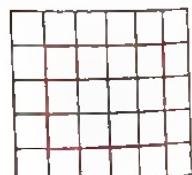
4. 40 cm

5. A rectangle has a perimeter of 18 cm.

Write down a possible pair of values for its length and width.

6. Jasmine says the perimeter of this shape is 12 units.

Explain her mistake.



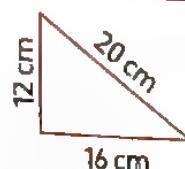
7. A rectangle has an area of 12 cm^2

a. Draw three possible rectangles.

b. Find the perimeter of the three rectangles.

8. The triangle and square have the same perimeter.

Find x

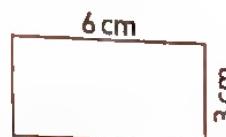


9. Fadil has a rectangular garden that is 5 meters wide and 4 times as long.

What is the area of Fadil's garden?

10. These two rectangles have the same area.

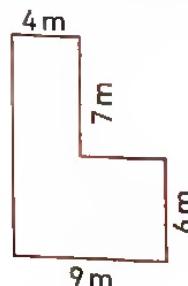
Find the length of the second rectangle.



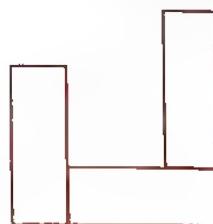
11. Wael wants to place a wooden fence around his vegetable garden.

Each meter of fencing costs L.E.10

Find the cost of the new fence.



12. Three rectangles have the same size are placed together to make the shape below.



Find the perimeter of the shape.

Cumulative Assessments on UNIT 1

Cumulative Assessment

1

On lesson 1 unit 1

1. Complete.

- The place value of the digit 4 in 24,681 is _____
- The value of the digit 7 in 730,566 is _____
- The largest number made up of the digits 6,5,2,0,9,1 is _____
- The number 1,280,035 has _____ digits.
- The largest 5-digit number is _____

2. Write each number in its appropriate column. Some may go in more than one column.

Sixteen

5

32,408

////

Two thousands

Digit	Number	Numerical

3. Choose the correct answer.

- The smallest number made of the digits 3,8,4,2,7 is _____
 A. 34,287 B. 42,378 C. 23,478 D. 87,432
- The value of 2 in 128,065 is _____
 A. 20,000 B. 2,000 C. 200,000 D. 200
- 87,621 < _____
 A. 90,001 B. 87,619 C. 84,935 D. 78,621
- The largest number of the following is _____
 A. 38,295 B. 703,067 C. 350,000 D. 17,824
- Which of the following digits makes the number sentence true $52,4 \square 1 > 52,461$ _____
 A. 4 B. 5 C. 6 D. 7

1. Choose the correct answer.

- a. Th digit _____ is in the ten Millions place in the numeral 346,870,251
 A. 8 B. 0 C. 5 D. 4
- b. The value of the digit 3 in the number 23,694,501 is _____
 A. 3,000 B. 30,000 C. 300,000 D. 3,000,000
- c. The value of the digit 4 in the number 42,780 is 10 times.
 the value of the digit 4 in which number?
 A. 146,703 B. 426,135 C. 34,651 D. 10,400
- d. _____ > 17,463
 A. 16,643 B. 71,346 C. 17,364 D. 15,999

2. Complete.

- a. [7 ten thousands and 5 hundreds] $\times 100$ = _____
- b. The number of hundreds in one million = _____
- c. The place value of the digit 0 in the number of 706,421,573 is _____
- d. 58,000 Thousands = _____ Millions.

3. Match.

- a. • 4 milliards , 683 millions
 17 thousands , 918
- b. • The digit 5 is in the hundred
 millions place in the number
- c. • (9 millions and 5 thousands) $\times 10$
- d. • 386 millions

1. • 38,600 ten thousands
2. • 90,050,000
3. • 4,683,017,918
4. • 7,524,800,673

Cumulative Assessment

3

Till lesson 3 unit 1

1. Choose the correct answer.

- a. $5,000,000 + 40,000 + 8,000 + 700 + 20 + 3 =$ _____
 A. 5,408,723 B. 5,048,723 C. 5,084,723 D. 5,048,273
- b. $4,800,000 =$ _____ Thousands
 A. 48 B. 480 C. 4,800 D. 480,000
- c. The number _____ has 9 digits.
 A. 36,423,100 B. 8,614,000 C. 125,000,694 D. 167,282
- d. _____ is the compose of $[6 \times 100,000] + [5 \times 10,000] + [3 \times 100] + [4 \times 10]$
 A. 650,340 B. 605,340 C. 650,304 D. 650,034

2. Complete.

- a. 34 millions, 905 thousands, 421 in standard form is _____
- b. The value of 7 in the number 720,358,014 is _____
- c. The expanded form of 5,614,003 is _____ + _____ + _____ + _____ + _____
- d. $[4 \text{ thousands and } 5 \text{ hundreds}] \times 1,000 =$ _____

3. Complete the following.

Composed: _____

Decomposed: _____ + _____ + _____ + $[2 \times 100,000] + [4 \times 1,000]$
 $+ \text{_____} + [7 \times 10] + [5 \times 1]$

Millions			Thousands			Ones		
H	T	O	H	T	O	H	T	O
6	1	8	—	0	—	3	—	—

Cumulative Assessment

4

Till lesson 4 unit 1

1. Compare. Write ($<$, $>$ or $=$).

a. $43,600,287$ $43,700,286$

b. $1,534,973$ $900,000 + 90,000 + 4,000 + 300 + 6$

c. Seven millions, two hundred forty six thousands $70,000,000$

d. $[5 \times 10,000,000] + [7 \times 1,000,000] + [4 \times 100,000] + [2 \times 1,000] + [6 \times 100]$ 1 milliard

2. Choose the correct answer.

a. 2,800 thousands $>$ _____

A. 2,800 hundreds

B. 28,000 hundreds

C. 28 millions

D. 2 milliards

b. The place value of 6 in 6,482,759,310 is _____

A. Millions

B. Ten Millions

C. Hundred Thousands

D. Milliards

c. The number 42,365,978 has _____ digits.

A. 10

B. 9

C. 8

D. 7

d. The missing digit such that $8,185 > 8,\underline{ }85$ is _____

A. 0

B. 1

C. 2

D. 3

3. Write a number in which the value of the digit 5 in the number 53,782 is 10 times the value of the digit 5 in your number. _____

4. Create a number that is smaller in the Ten Million place than 745,864,251. _____

5. Create a number that make the comparison true. Use all the lines.

_____,_____,_____,_____, $< 372,861,431$

1. Choose the correct answer.

a. Which choice shows the numbers in an ascending order?

A. $1. 700 + 50 + 7$

2. Seven hundred seventy-five

3. 765

4. Eight hundred five

B. $1. 780$

2. Eight hundred forty

3. $800 + 50 + 1$

4. one thousand

C. $1. 572$

2. $500 + 80 + 1$

3. Five hundred seventy-two

4. $600 + 70 + 4$

D. $1. Six\ hundred\ five$

2. $600 + 50$

3. 674

4. Six hundred nine

b. Which digit makes the number sentence true? $3,521,432 < 3, \underline{\quad} 21,432$

A. 3

B. 4

C. 5

D. 6

c. Which number sentence is true?

A. $74,562 < 9,856$

B. $300,000 + 40 < 700,000 + 20$

C. million $< 792,561$

D. $482 > 7,914$

d. In the number 48,789 How many times greater is the digit in the Thousands place than the digit in the Tens place?

A. 10

B. 100

C. 1,000

D. 10,000

2. Write each of the following numerals in standard form and arrange in an ascending order.

• $[5 \times 1,000,000,000] + [2 \times 10,000,000]$

+ $[5 \times 1,000] + [1 \times 10] + [8 \times 1]$

• Five Milliard, three million, fifty three

• $5,000,000,000 + 4,000,000 + 6,000 + 9$

• $525,000,508$

Standard form	Ascendingly

3. Complete.

a. [5 ten thousands and 7 tens] $\times 100 =$ _____

b. Six milliard, four hundred two million, twenty-eight in standard form is _____

c. The value of the digit 4 in the number 3,456,261,852 is _____

d. _____ is 100 times greater than fifty thousand.

Cumulative Assessment

6

Till lesson 6 unit 1

- 1.** Use Front-End strategy to estimate each of the following.

a. $89,562 \rightarrow$ _____

b. $9,000,000,000 + 7,000,000 + 900 \rightarrow$ _____

c. Three milliard, five hundred thirty-two million \rightarrow _____

d. $[5 \times 1,000,000,000] + [8 \times 100,000,000] + [9 \times 1,000] + [8 \times 100] \rightarrow$ _____

- 2.** Use place value strategy to round each of the following.

a. $4,865 \approx$ _____ [to the nearest 100]

b. $7,985,462 \approx$ _____ [to the nearest Hundred Thousand]

c. $99,999,862 \approx$ _____ [to the nearest Million]

d. $54,321,782 \approx$ _____ [to the nearest Ten Thousand]

- 3.** Choose the correct answer.

a. $78,562 \quad 9,000 + 800 + 50 + 4$

A. > B. < C. =

b. $740,000$ is _____ times more than $7,400$

A. 10 B. 100 C. 1,000 D. 10,000

c. Which two numbers round to 700,000 when rounded to the nearest Hundred Thousand?

A. 706,999 B. 752,384 C. 799,999 D. 745,678 E. 789,653

d. 870 Hundreds = _____ Tens.

A. 87 B. 8,700 C. 87,000 D. 870,000

- 4.** Write 5 different numbers if rounded to the nearest hundred the result is 784,500

- 5.** Complete.

Composed : 7,453,361,214

Decomposed : _____

Cumulative Assessments on UNIT 2

Cumulative Assessment

7

Till lesson 1 unit 2

1. Choose the correct answer:

- a. Fady wrote $994 + 0 = 994$ using the _____ property.
 A. additive identity B. commutative C. associative
- b. $70,000,000 + 8,000 + 50 + 1$ _____ Seven million, twenty.
 A. $>$ B. $<$ C. $=$
- c. Which number round to 3,500,000 when rounded to the nearest Hundred Thousand ?
 A. 3,562,531 B. 3,426,217 C. 3,524,261 D. 3,584,212
- d. The value of the digit 6 in the number 63,785 is 100 times the value of the digit 6 in which number?
 A. 46,521 B. 94,682 C. 241,261 D. 432,216

2. Put (✓) to the correct answer and (✗) to the incorrect answer.

- a. $35 - 14 = 14 - 35$ ()
- b. The place value of the digit 4 in the number 5,862,431,811 is Hundred Thousand ()
- c. The compose of number $[7 \times 10,000] + [2 \times 1,000] + [4 \times 100]$ is 72,400 ()
- d. The smallest 6- different digit number is 10,234 ()

3. Solve each problem and name the property used.

- a. $17 + 8 + 3$ _____
- b. $35 + 14 + 15 + 36$ _____

4. How many times greater is the value of a number in the Ten Thousands place than the same number in the Ten place ?

Cumulative Assessment

8

Till lesson 2 unit 2

1. Estimate to find the results use Front-End Estimation strategy. Show your steps.

a. $123 + 79$ _____

b. $813 - 141$ _____

2. Add or subtract mentally. Use compensation strategy. show your steps.

a. $97 + 35$ _____

b. $248 - 16$ _____

3. Add or subtract mentally. Use Break up and Bridge strategy, show your steps.

a. $64 + 51$ _____

b. $86 - 32$ _____

4. Complete.

a. $38 + 7 = 7 + \underline{\hspace{2cm}}$ [_____ property]

b. 4,325,021,310 in word form is _____

c. $6,756,262 \approx 6,800,000$ [Rounded to the nearest _____]

d. $73 + 1 + 99 = 73 + [1 + \underline{\hspace{2cm}}]$ [_____ property] = $73 + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

5. Solve the problem and name the property you used $142 + 55 + 18 + 45$

6. In the numeral 1,256,789 what digit is in the

a. Hundreds place? _____

b. Ten Thousands place? _____

c. Millions place? _____

Cumulative Assessment

9

Till lesson 3 unit 2

1. Choose the correct answer.

- a. 24,000 is _____ times more than 2,400
 A. 10 B. 100 C. 1,000 D. 10,000
- b. Which of these statement used only commutative property of addition to find $17 + 48 + 13$?
 A. $[17 + 48] + 13$ B. $17 + 13 + 48$ C. $17 + [13 + 48]$ D. $[17 + 13] + 48$
- c. $58,000 =$ _____ tens.
 A. 58,000 B. 5,800 C. 580 D. 58
- d. $(3 \text{ hundreds and } 5 \text{ tens}) \times 100 =$ _____
 A. 350 B. 3,500 C. 35,000 D. 350,000

2. Estimate using rounding to the nearest 100. Find the exact answer.

a.
$$\begin{array}{r} 35,462 \\ + 23,221 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 2,942 \\ + 350 \\ \hline \end{array}$$

c.
$$\begin{array}{r} 94,641 \\ + 2,961 \\ \hline \end{array}$$

3. Add or subtract mentally. Tell the strategy you used.

a. $728 - 399 =$ _____

b. $5,112 + 320 =$ _____

4. In a week 3,573 tourists visited Giza pyramids and in the next week 4,230 tourists visited it. Find the number of tourists in the two week? [Round to the nearest Hundred]

5. Arrange in a descending order, using the forms which the numbers are written.

- $[3 \times 1,000,000,000] + [5 \times 10,000,000] + [4 \times 10]$
- Three milliard, five hundred million, fourteen
- 3,000,786,562
- $3,000,000,000 + 20,000,000 + 400$

The order is : _____

Cumulative Assessment

10

Till lesson 4 unit 2

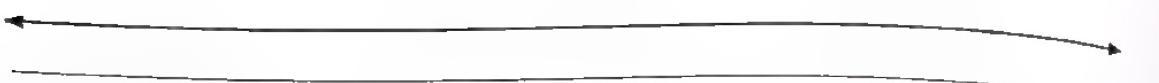
- 1.** a. Solve $852 - 465$ using counting down.

Using number line with decomposing strategy.



- b. Solve $5,425 - 1,373$ using counting on.

Using number line with decomposing strategy.



- c. Solve the following problems, then round to the nearest Ten to check the reasonableness of your answer.

$$\begin{array}{r} 7,356 \\ - 2,547 \\ \hline \end{array}$$

$$\begin{array}{r} 3,785 \\ + 2,816 \\ \hline \end{array}$$

- 2.** Write ($<$, $>$ or $=$).

- | | | |
|--------------------|-----------------------|---|
| a. $7,856,432$ | <input type="radio"/> | $7,000,000 + 80,000 + 6,000 + 900 + 80 + 9$ |
| b. $842 + 237$ | <input type="radio"/> | $3,225 - 2,784$ |
| c. $7,423 + 8,612$ | <input type="radio"/> | $22,520 - 7,250$ |
| d. 370 Hundreds | <input type="radio"/> | 3,700 Tens |

- 3.** A factory produced 2,879 toys in one week the next week, the factory produced 3,267 toys. Find the difference between the production in two weeks.

- 4.** Subtract mentally. Use counting (Add to subtract) strategy. Show your steps.

a. $432 - 395$

b. $276 - 194$

Cumulative Assessment

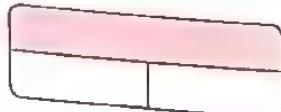
11

Till lesson 5 unit 2

1. Solving equations with variable. create a bar model.

a. $s - 74,252 = 23,402$

Bar model:



Solution:

b. $b + 4,261 = 21,253$

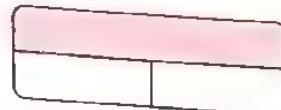
Bar model:



Solution:

c. $47,261 - m = 31,422$

Bar model:



Solution:

d. $45,261 + k = 52,428$

Bar model:



Solution:

2. Choose the correct answer.

a. [5 tens and 4 ones] $\times 100 =$ _____

A. 54

B. 540

C. 5,400

D. 54,000

b. 35,000 is _____ times more than 350

A. 10

B. 100

C. 1,000

D. 10,000

c. $[8 \times 1,000,000] + [7 \times 10,000] + [5 \times 100] + [6 \times 10]$ in standard form is _____

A. 87,560

B. 8,070,560

C. 8,700,560

D. 870,560

d. If $x - 8 = 13$ then $x =$ _____

A. 5

B. 4

C. 21

D. 22

3. Ant colony A has 32,425 male ants, if the colony has 74,319 ants. How many ants are female?

Bar model:



Solution:

4. Use the properties of addition to find the sum.

a. $75 + 87 + 25 =$ _____

b. $712 + 59 + 28 + 111 =$ _____

1. Complete the following.

a. If $b - 34,252 = 12,604$, then $b = \underline{\hspace{2cm}}$

b. The value of the digit 4 in the number 4,851,061,052 is $\underline{\hspace{2cm}}$

c. 2,785,629,142 in expanded form is $\underline{\hspace{2cm}}$

d. $15 + 5 + 7 = [15 + 5] + \underline{\hspace{2cm}} \text{ (} \underline{\hspace{2cm}} \text{ property)} = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

e. $47,562 - 2,853 = \underline{\hspace{2cm}}$

f. $\underline{\hspace{2cm}}$ is 10 times greater than three hundred.

2. Port Said has a population of 782,180 if South Sinai has a population 111,835 and North Sinai has a population of 450,528 How many more people do Port Said than South Sinai and North Sinai have combined ?

3. Add or subtract mentally. Tell the strategy you used.

a. $112 - 78 = \underline{\hspace{2cm}}$

b. $102 + 288 = \underline{\hspace{2cm}}$

4. Estimate using rounding to the nearest 100. Find the exact answer.

a.
$$\begin{array}{r} 5,646 \\ - 2,389 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 72,861 \\ - 5,466 \\ \hline \end{array}$$

c.
$$\begin{array}{r} 2,462 \\ + 1,391 \\ + 946 \\ \hline \end{array}$$

5. Write ($<$, $>$ or $=$).

a. $9,000,000 + 70,000 + 50 \bigcirc \text{ nine million, seven thousand, fifty-nine.}$

b. $40,000 - 1,523 \bigcirc 37,456 + 2,652$

c. $2,394 + 5,291 \bigcirc 12,006 - 4,321$

d. The value of the digit 8 in the number 381,452,671 \bigcirc The value of the digit 8 in the number 1,815,462

First Month Assessments

Model

1

1. Put (✓) to the correct answer and (✗) to the incorrect answer.

- a. The least 6 - digit number formed from 2, 8, 0, 5, 1, 4 is 201,458 ()
- b. 57,000 is 100 times more than 570 ()
- c. $7,865,462 > 985,947$ ()
- d. If $x + 11 = 20$, then $x = 9$ ()
- e. $14 + 0 = 0$ ()
- f. The place value of the digit 5 in the number 3,521,623,124 is Ten Million. ()

2. Choose the correct answer.

- a. [8 thousands and 2 tens] $\times 100 =$ _____
 A. 820 B. 8,200 C. 802,000 D. 820,000
- b. $873 + 27 = 27 + 873$ is used _____ property
 A. additive identity B. commutative C. associative
- c. $3,000,000,000 + 500,000 + 70,000 + 40 + 8 =$ _____
 A. 35,748 B. 3,000,570,048 C. 3,570,000,048 D. 3,000,057,048
- d. By using Front-End strategy $8,784,251 \approx$ _____
 A. 7,000,000 B. 8,000,000 C. 9,000,000 D. 10,000,000
- e. Which answer using rounding strategy to estimate $482 - 211$?
 A. $500 - 200 = 300$ B. $400 - 200 = 200$
 C. $400 - 100 = 300$ D. $500 - 100 = 400$
- f. Seven million, three hundred thousand, fourteen > _____
 A. 7,247,561 B. 7,908,562 C. 12,462,591 D. 432,563,291

3. Complete the following.

a. In the opposite bar model, the equation which you can form for it is _____, the value of $x =$ _____

43	
x	17

b. $8,625 - 438 =$ _____

c. $785,000 =$ _____ hundreds

d. compose : 846,025,031, then decompose is _____

e. 4,312,601 in word form is _____

f. $37 + 3 + 40 = [37 + 3] + 40$ (_____ property) = _____ + _____ = _____

4. Match.

a. • $7,452 + 2,931$

1. • Round off 3,642 to the nearest hundred

b. • $8,355 - 287$

2. • eight thousand , sixty-eight

c. • $1,039 + 2,561$

3. • $3,600 + 42$

d. • $[3 \times 1,000] + [6 \times 100]$
 $+ [4 \times 10] + [2 \times 1]$

4. • $10,000 + 300 + 80 + 3$

5. Find the result mentally. Tell the strategy you used.

a. $102 - 43$ _____

b. $612 + 115$ _____

6. Use properties of addition to find the answer $842 + 32 + 58$

7. Solve the equation, create a bar model

$$35,641 - Y = 22,268$$



8. Write five numbers that round to 25,000

9. A factory produced 4,256 toys in one month.

If the factory produced the same number each month.

How many toys were produced in three months?

10. Write a numeral that is greater than 5,341,621,800 and a numeral that is less than 5,341,621,800 and write the three numeral in a descending order.

11. Use place value strategy to round each of the following.

a. 7,852 [to the nearest hundred] _____

b. 9,985,468 [to the nearest hundred thousand] _____

12. Write in standard form.

a. One milliard, fifteen _____

b. $[5 \times 1,000,000] + [2 \times 1,000] + [4 \times 10]$ _____

Model

2

1. Put (✓) to the correct answer and (✗) to the incorrect answer.

- a. $78,562 <$ seven hundred thousand, five hundred. ()
- b. If $x - 9 = 14$, then $x = 23$ ()
- c. The place value of the digit 5 in the number 754,271,601 is hundred million. ()
- d. 9,758 is estimated by front-end strategy is 10,000 ()
- e. The largest 5-different digit number is 98,765 ()
- f. 8,900 hundred = 890 tens. ()

2. Choose the correct answer.

- a. In which place is the 5 has a value 100 times greater than the 5 in hundred place ?
 A. Hundred B. Thousand
 C. Ten thousand D. Hundred thousand
- b. [7 thousand and 4 ten] $\times 10 =$ _____
 A. 7,040 B. 70,400 C. 74,000 D. 7,400
- c. The missing number to be $7,856 < 7,\underline{\quad}56$ can be _____
 A. 9 B. 8 C. 7 D. 6
- d. Which number rounded to 150,000 when rounded to the nearest ten thousand ?
 A. 156,781 B. 158,986 C. 142,861 D. 149,125
- e. If $m + 23 = 32$ then $m =$ _____
 A. 55 B. 60 C. 9 D. 7
- f. If $0 + 8,321 = 8,321$ is using _____ property.
 A. associative B. commutative C. additive identity

3. Complete.

- a. In the bar model,  the equation which you can form for it is _____
- b. The value of the digit 0 in the number 302,563,421 is _____
- c. _____ is 100 times greater than ten million.
- d. The number 2,643,891 is estimate to _____ by front-end strategy.
- e. Sixty-three million, seven hundred forty-one thousand, thirty four in standard form is _____
- f. $2,227 - 181 =$ _____

4. Match.

a. $[5 \times 10,000] + [6 \times 1,000] + [7 \times 10] + [2 \times 1]$

1. 

b. $53,158 + 3,562$

2. 

c. $8,458 - 2,786$

3. 

d. 56,725 round to the nearest 10

4. 

5. What is the number that is 1,000 times greater than 782 ?

6. Use properties of addition to find the result $198 + 50 + 2$

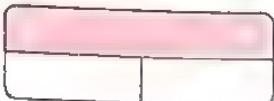
7. Write each of the following numerals in standard form and arrange in an ascending order:

- $[8 \times 1,000,000] + [5 \times 10,000] + [8 \times 100] + [9 \times 10]$
- Eight million, five hundred eighty thousand, nine
- One million, sixty-four thousand, nineteen
- 8,456,291

Standard form	Ascending order

8. The queen laid 142,350 eggs in 3 days.
 If she laid 100,890 eggs in 2 days, how many eggs did she lay on day 3?

Bar model:



Equation:

Solution:

9. In the numeral 5,462,931 what digit is in the

a. Tens place _____

b. Ten thousand place _____

10. Find each result using mental math.

a. $46 + 32$ _____b. $93 - 38$ _____

11. In the number 745,376 how many times greater is the digit in the hundred thousands place than the digit in tens place ?

12. Estimate using rounding to the nearest 1,000. Find the exact answer.

a. $74,526$

$+ 2,891$

b. $42,253$

$- 25,862$

Index of Theme 2 (Units 5 to 8)

UNIT
5



Multiplication as a Relationship

Concept 1

Multiplicative Comparisons

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Concept 2

Properties and Patterns of Multiplication

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UNIT
6



Factors and Multiples

Concept 1

Understanding Factors

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Concept 2

Understanding Multiples

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UNIT
7

Multiplication and Division : Computation and Relationships

Concept 1

Multiplying by 1-Digit and 2-Digit Factors

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Concept 2

Dividing by 1-Digit Divisors

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UNIT
8

Order of Operations

Concept 1

Order of Operations

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GLOSSARY

Multiplication as a Relationship

- » Concept 1 : Multiplicative Comparisons
- » Concept 2 : Properties and Patterns of Multiplication



Fast Fact

An adult grasshopper can jump 10 times its length straight into the air and 20 times its length horizontally without using its wings. That is, if a grasshopper is 5 centimeters long, it can jump a distance of 1 meter.



Concept

1

Multiplicative Comparisons



Concept Overview

In concept 1:

Multiplicative Comparisons, students continue to compare numbers but move away from place value comparisons into multiplicative relationships. It is important for students to review and recall the multiplication facts they learned in Primary 3, since this makes it easier for them to see multiplicative relationships in familiar numbers. Students also discuss the application of multiplicative comparisons in real-world contexts, connecting their understanding of math to their daily lives.

Fast Fact

The ant is one of the world's strongest creatures in relation to its size. A single ant can carry 50 times its own bodyweight, and they'll even work together to move bigger objects as a group!

Lesson No.	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 1	5-1 Understanding Multiplicative Comparison	Estimate - Multiplicative comparison - Tape diagram	<ul style="list-style-type: none">Students will define multiplicative comparison.Students will model multiplicative comparison problems.
Lesson 2	5-2 Creating Multiplicative Comparison Equations	Equation - Factor - Multiplicative comparison - Product	<ul style="list-style-type: none">Students will create equations to represent multiplicative comparison problems.Students will use letters to represent unknown quantities in equations.
	5-3 Solving Multiplicative Comparison Equations	Inverse	<ul style="list-style-type: none">Students will create and solve multiplicative comparison equations.

5-1 Understanding Multiplicative Comparison

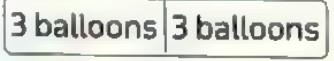
Learn What is multiplicative comparison ?

Multiplicative comparison means comparing two things or sets that need multiplication.

For Example : In a birthday party,

Amgad has 3 balloons	Bassem has 6 balloons
	

You can use multiplication as a way to compare between what they have as follows :

Tape diagram	Comparison statement	Multiplication equations
Amgad :  Bassem : 	Bassem has twice as many balloons as Amgad has. Or 6 is two times greater than 3	$6 = 2 \times 3$



Remember

Multiplication is repeated addition.

So, you can rewrite a multiplication equation as repeated addition equation.

$$6 = 2 \times 3 \quad \rightarrow \quad 3 + 3 = 6$$

Hint

$6 = 2 \times 3$ means

6 is two times greater than 3

Or 6 is three times greater than 2

Notes for parents :

- Make sure your child understands that the "tapes" in the tape diagram represent equal groups. When constructing a tape diagram, each tape should represent the same quantity.

Example 1

Complete the comparison statements. Use tape diagram or multiplication facts to compare.

a. Compare 15 and 5. 15 is _____ times greater than 5.

b. Compare 50 and 10. 50 is _____ times greater than 10.

Solution 

a. three [think:  , $15 = 3 \times 5$]

b. five [think:  , $50 = 5 \times 10$]

Example 2

Rewrite each equation using multiplication.

a. $5 + 5 + 5 = 15$

b. $3 + 3 + 3 + 3 + 3 + 3 + 3 = 21$

Solution 

a. $3 \times 5 = 15$

b. $7 \times 3 = 21$

Example 3

Fill in the blanks to complete the multiplicative comparison statement for each tape diagram.



_____ is _____ times greater than 8



_____ is _____ times greater than 5

Solution 

a. 48 is 6 times greater than 8.

b. 40 is 8 times greater than 5.

 **Check**

your understanding

Complete the table. Write a comparison statement or a multiplication equation.

Comparison Statement	Multiplication Equation
21 days is 3 times longer than 7 days	
	$36 = 9 \times 4$
30 fish is 5 times as many as 6 fish.	

- Children often confuse multiplicative comparison with additive comparison. For example, instead of multiplying by 4 to find a number 4 times greater than 20, they might add 4

Exercise **26**

5-1 Understanding Multiplicative Comparison

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

1. Use tape diagram or multiplication facts to compare the numbers.

- a. Compare 15 and 3. 15 is _____ times greater than 3.
- b. Compare 28 and 7. 28 is _____ times greater than 7.
- c. Compare 27 and 9. 27 is _____ times greater than 9.
- d. Compare 10 and 2. 10 is _____ times greater than 2.
- e. ... Compare 12 and 3. 12 is _____ times greater than 3.
- f. ... Compare 18 and 6. 18 is _____ times greater than 6.
- g. Compare 18 and 9. 18 is _____ times greater than 9.
- h. Compare 21 and 7. 21 is _____ times greater than 7.
- i. Compare 24 and 6. 24 is _____ times greater than 6.
- j. Compare 35 and 7. 35 is _____ times greater than 7.
- k. Compare 30 and 5. 30 is _____ times greater than 5.
- l. Compare 56 and 8. 56 is _____ times greater than 8.
- m. Compare 72 and 8. 72 is _____ times greater than 8.
- n. Compare 54 and 9. 54 is _____ times greater than 9.
- o. Compare 30 and 3. 30 is _____ times greater than 3.
- p. Compare 8 and 4. 8 is _____ times greater than 4.
- q. Compare 27 and 3. 27 is _____ times greater than 3.
- r. Compare 20 and 5. 20 is _____ times greater than 5.
- s. Compare 25 and 5. 25 is _____ times greater than 5.
- t. Compare 36 and 6. 36 is _____ times greater than 6.

2. Rewrite each equation using multiplication.

a. $\boxed{6} + 6 + 6 = 18$

b. $\boxed{2} + 2 + 2 + 2 + 2 + 2 + 2 = 14$

c. $5 + 5 + 5 = 15$

d. $2 + 2 + 2 + 2 = 8$

e. $9 + 9 + 9 + 9 = 36$

f. $10 + 10 + 10 + 10 + 10 = 50$

g. $8 + 8 + 8 + 8 + 8 + 8 + 8 = 56$

h. $7 + 7 + 7 + 7 = 28$

i. $3 + 3 + 3 + 3 + 3 + 3 + 3 = 21$

j. $4 + 4 + 4 + 4 + 4 = 20$

3. Complete each of the following.

a. $3 + 3 + 3 + 3 = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

b. $4 + 4 + 4 = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

c. $2 + 2 + 2 + 2 + 2 = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

d. $8 + 8 = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

e. $7 + 7 + 7 + 7 + 7 + 7 = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

f. $5 + 5 + 5 + 5 + 5 = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

4. Fill in the blanks to complete the multiplicative comparison statement for each tape diagram.

$\underline{\hspace{2cm}}$ is $\underline{\hspace{2cm}}$ times greater than 5.



$\underline{\hspace{2cm}}$ is $\underline{\hspace{2cm}}$ times greater than 8.

c. (.)

4	4	4	4
---	---	---	---

is — times greater than 4.

e.

3	3	3	3	3	3	3
---	---	---	---	---	---	---

is — times greater than 3.

g.

10	10	10	10
----	----	----	----

— is — times greater than 10.

i.

9	9	9	9	9	9	9	9	9
---	---	---	---	---	---	---	---	---

— is — times greater than 9.

d.

2	2	2	2	2	2
---	---	---	---	---	---

is — times greater than 2.

f.

6	6	6	6	6	6	6	6
---	---	---	---	---	---	---	---

— is — times greater than 6.

h.

7	7	7	7	7	7	7	7
---	---	---	---	---	---	---	---

— is — times greater than 7.

j.

10	10	10	10	10
----	----	----	----	----

— is — times greater than 10.

5. Write a multiplication equation to match each comparison statement as the example.

	Comparison Statement	Multiplication Equation
Ex.	10 is 5 times greater than 2	$10 = 5 \times 2$
a.	24 is 6 times greater than 4	
b.	35 is 7 times greater than 5	
c.	15 is 3 times greater than 5	
d.	20 is 4 times greater than 5	
e.	60 is 10 times greater than 6	
f.	16 is 8 times greater than 2	
g.	6 is 2 times greater than 3	
h.	5 is 5 times greater than 1	

6. Write a comparison statement to match the multiplication equation as the example.

	Comparison Statement	Multiplication Equation
Ex.	8 is 2 times greater than 4	$8 = 2 \times 4$
a.		$6 = 3 \times 2$
b.		$24 = 8 \times 3$
c.		$45 = 9 \times 5$
d.		$30 = 6 \times 5$
e.		$70 = 10 \times 7$
f.		$12 = 3 \times 4$

Challenge

7. Suzie is 14 dm tall. There is a tree in her yard
that is 10 times taller than she is. How tall is
the tree in Suzie's yard?
-
-



8. Hanan has 40 photos. She has 5 times as
many photos as Hany.
How many photos does Hany have?

Hany ?

Hanan ? ? ? ? ?

40



Multiple Choice Questions

Choose the correct answer:

1. To compare 20 and 5.

- 20 is _____ times greater than 5.
- A. 2
 - B. 3
 - C. 4
 - D. 5

3. The multiplication equation of

- $5 + 5 + 5 + 5 = 20$ is _____
- A. $2 \times 10 = 20$
 - B. $4 \times 5 = 20$
 - C. $20 \times 1 = 20$
 - D. $10 + 10 = 20$

5. The multiplication equation of the

- comparison statement "36 is 4 times greater than 9" is _____
- A. $9 + 9 + 9 + 9 = 36$
 - B. $36 = 6 \times 6$
 - C. $36 = 4 \times 9$
 - D. $3 \times 12 = 36$

7. To compare 45 and 9.

- 45 is _____ times greater than 9.
- A. 5
 - B. 4
 - C. 3
 - D. 2

9. The multiplication equation of the comparison statement "20 is 10 times greater than 2"

- is _____
- A. $20 = 10 \times 2$
 - B. $20 = 10 + 10$
 - C. $20 = 4 \times 5$
 - D. $20 = 1 \times 20$

10. Which statement is an example of a multiplicative comparison ? _____

- A. A camel is 3 meters in length. A crocodile is 2 meters longer than a camel.
- B. A camel can weigh up to 1,000 kilograms. This is twice as much as a crocodile weighs.
- C. Crocodiles have 64 teeth. Camels have 32 fewer teeth than crocodiles.
- D. There are about 30,000 crocodiles in Egypt. There are about 60,000 more camels in Egypt

2. To compare 30 and 6.

- 30 is _____ times greater than 6.
- A. 3
 - B. 4
 - C. 5
 - D. 6

4. The multiplication equation of

- $6 + 6 + 6 = 18$ is _____
- A. $18 \times 1 = 18$
 - B. $8 + 10 = 18$
 - C. $2 \times 9 = 18$
 - D. $3 \times 6 = 18$

6. The comparison statement for the

- multiplication equation " $24 = 3 \times 8$ " is _____
- A. 24 is 3 times smaller than 8.
 - B. 24 is 3 times greater than 8.
 - C. 8 is 3 times greater than 24.
 - D. 3 is 8 times greater than 24.

8. The multiplication equation of

- $10 + 10 + 10 = 30$ is _____
- A. $5 \times 6 = 30$
 - B. $3 \times 10 = 30$
 - C. $10 + 20 = 30$
 - D. $1 \times 30 = 30$

5-2 Creating Multiplicative Comparison Equations**5-3 Solving Multiplicative Comparison Equations****Learn**

During Emad's visit to the Zoo, he read this information.

Can you help him to calculate the tall of the giraffe ?

Read and Understand

What do you know ?

What are you trying to find ?



The giraffe in the zoo is 3 times as tall as the kangaroo. The kangaroo is 2 m tall. How tall is the giraffe?

**Plan and Solve**

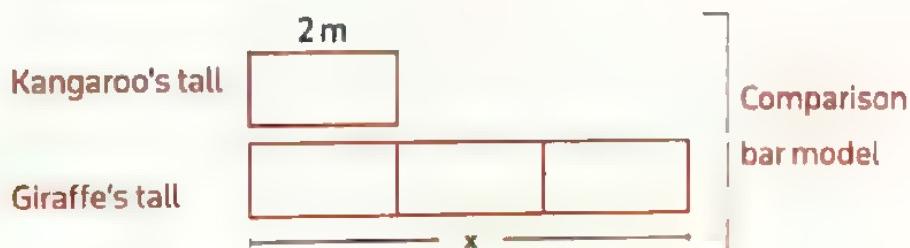
What strategy will you use ?

Strategy: Write a multiplicative comparison equation

1. Use a letter to represent the unknown.

Let the tall of the giraffe be x .

2. The giraffe is 3 times as tall as the kangaroo means,
 x is 3 times 2



3. Write an equation: $x = 3 \times 2$

4. Solve the equation: $x = 6$

So, the giraffe is 6 m tall

Notes for parents :

- **Common Error :** Your child may incorrectly place the unknown in an equation. For example, if your child is asked to write 12 is 3 times greater than a , he/she may write $12 \times 3 = a$, instead of $12 = 3 \times a$ or $3 \times a = 12$

Example 1

Write an equation based on the comparison statement.

Use a letter to represent the unknown.

a. 3 times greater than 5 is _____

b. 12 is 6 times as many as _____

Solution 

a. $3 \times 5 = a$

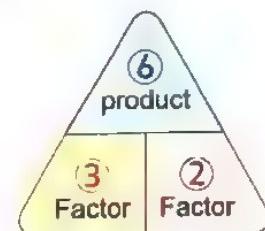
b. $12 = 6 \times m$

How to solve multiplication comparison equation ?

You know that

$$6 = 3 \times 2$$

↓ ↓ ↓
Product Factor Factor

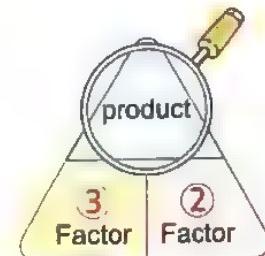


- Solving an equation means to find the value of the unknown that makes the equation true.

- If the unknown is the product, use multiplication.

$$m = 3 \times 2$$

Product Factor Factor

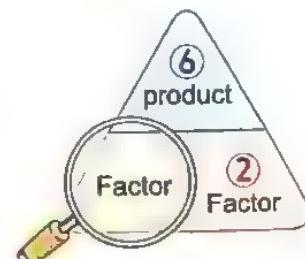


Multiply: $m = 6$

- If the unknown is one of the two factors, use division.

$$6 = m \times 2$$

Product Factor Factor



Divide: $m = 6 \div 2 = 3$

Example 2

Write an equation for each of the following comparisons and then solve it.

a. What number is 3 times greater than 7?

b. 24 is 4 times more than what number?

c. 12 is 3 times more than what number?

Notes for parents :

- It is important to note that the unknown can be in different positions in the equation. Explain that to solve an equation, you find what the unknown number is.

Solution

a. Equation : $3 \times 7 = m$

Answer : $m = 21$ The number is **21**

b. Equation : $24 = 4 \times h$

Answer : $h = 24 \div 4 = 6$ The number is **6**

c. Equation : $12 = 3 \times a$

Answer : $a = 12 \div 3 = 4$ The number is **4****Example 3**

Write an equation for the following comparison and then solve.

Wael ate 5 figs in the evening. His older brother ate 4 times as Wael ate.

How many figs did his brother eat ?

**Solution**Let the number of figs of his brother is a

• Equation : $a = 4 \times 5$

• Answer : $a = 20$

His brother ate 20 figs.

Example 4

There were thirty-five adults in line at a movie theater. That is seven times the number of children in another line. How many children were in this line ?

SolutionLet the number of children is n . Then, 35 equal 7 times n

• Equation : $35 = 7 \times n$

• Use division to solve : $n = 35 \div 7 = 5$

So, the number of children in the line is 5 children.

**check**

your understanding

1. Solve each of the following equations.

a. $x = 3 \times 6$

b. $14 = 7 \times n$

c. $6 \times y = 24$

2. Write an equation to represent the situation below, and then solve.

Farmer Wael has 20 sheep. He has twice the number of sheep as farmer Sameh.

What is the number of sheep of farmer Sameh ?

- Explain that the missing number in an equation is represented by a blank, but we can use letters to represent missing numbers.

Exercise**27****5-2 Creating Multiplicative Comparison Equations
5-3 Solving Multiplicative Comparison Equations**

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

1. Write an equation based on the comparison statement. Use a letter to represent the unknown number. You do not have to solve the equations.

- a. 4 times greater than 3 is _____
- b. 18 is 6 times as many as _____
- c. 2 times greater than 7 is _____
- d. 24 is 4 times as great as _____
- e. 25 is 5 times as many as _____
- f. 16 is 4 times as many as _____
- g. 7 times greater than 2 is _____
- h. 5 times greater than 8 is _____
- i. 30 is 5 times as many as _____
- j. 3 times greater than 10 is _____
- k. 7 times as many as 4 is _____
- l. 6 times greater than _____ is 48.
- m. 27 is _____ times greater than 9.
- n. 10 times as 3 is _____
- o. 6 is _____ times greater than 2.
- p. 3 times as 6 is _____
- q. 15 is _____ times greater than 5.
- r. 8 times greater than _____ is 24.
- s. 20 is _____ times greater than 4.
- t. 5 times greater than _____ is 15.



2. Write an equation for the comparisons. Use a letter to represent the unknown number.

You do not have to solve the equations.

- a. Nadia collected 5 marbles in March. By May she had 4 times as many marbles. How many marbles does Nadia have in May?



- b. Hamed had 12 cookies, which was 3 times as many cookies as his brother Ahmed. How many cookies did Ahmed have?



- c. It took Aida 21 minutes to walk to school on Monday. On Tuesday, it took her 7 minutes to ride her bike to school. How many times faster was riding her bike than walking?



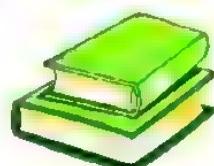
- d. Menna ran around the soccer field 4 times. Aya ran around the field twice as many times. How many times did Aya run around the field?



- e. Rana has 6 mangoes. Her brother Sherif has 18. How many times more mangoes does Sherif have?



- f. A library checks out four mathematics books and two sciences books an hour. How many times more mathematics books do they check out than sciences books?



- g. A restaurant sold eight times as many salads as they sold steaks. If they sold four steaks, how many salads did they sell?



- h. A restaurant sold nine salads and forty-five steaks. How many times as many steaks did they sell as salads?



- i. A pet store sold two cats. They sold six times as many dogs as they sold cats. How many dogs did they sell?



3. Write an equation for each of the following comparisons, and then solve it.

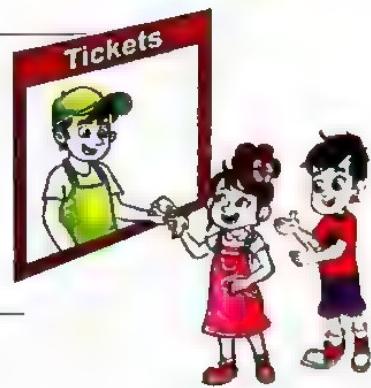
- a. \square What number is 5 times greater than 6?

- b. \square 36 is 4 times more than what number?

- c. \square Ayman ate 4 figs in the morning. His older brother ate 3 times as many. How many figs did his brother eat?



- d. There were thirty-two adults and four children in line at a movie theater. How many times more adults were in the line than children?



- e. Mona sent twenty-five text messages a day. Esslam sent five a day. How many times as many texts did Mona send than Esslam sent ?
-
-



- f. It takes Wael six oranges to make a small glass of orange juice. He uses eight times as many for a large glass. How many oranges does he use for a large glass ?
-
-



- g. Nora had four times as many Pounds as her sister. Her sister has three Pounds. How much money does Nora have ?
-
-



- h. Samah was playing basketball. She scored seven times as many shots as she missed. If she scored fourteen shots, how many shots did she miss ?
-
-



4. Solve each of the following.

O

a. $y = 5 \times 10$

b. $x \times 3 = 15$

c. $7 \times b = 21$

d. $3 \times 4 = x$

e. $5 \times b = 50$

f. $m \times 4 = 16$

g. $z = 5 \times 1$

h. $n \times 2 = 18$

i. $5 \times k = 35$

5.



How many seats ? Use the information in the table to compare numbers of seats in different modes of transportation. Then, enter and solve an equation for each comparison.

Means of Transportation	Number of Seats
Bike	1
Motorcycle	2
Car	4
Truck	6
Bus	36
Metro train	48

a. How many times as many seats are in a truck than on a motorbike ?

Equation : _____

Answer : _____

b. How many times as many seats are on a bus than in a truck ?

Equation : _____

Answer : _____

c. How many times as many seats are on the metro train than in a car ?

Equation : _____

Answer : _____

d. A metro train can fit how many times more people than a truck ?

Equation : _____

Answer : _____

e. A bus has how many times more seats than a car ?

Equation : _____

Answer : _____



Challenge

6. Bassem sold 9 chocolate bars. Marawan sold three times as many as Bassem. Esslam sold 9 fewer than Marawan. How many bars did Esslam sell ?

Multiple Choice Questions

D

Choose the correct answer:

1. The equation based on the comparison statement «3 times greater than 7» is _____
- A. $3 \times 7 = A$ B. $7 - 3 = A$
 C. $3 + 7 = A$ D. $7 \div 3 = A$

2. The equation based on the comparison statement «45 is _____ times greater than 9» is _____
- A. $45 = 9 - a$ B. $45 = a \times 9$
 C. $45 = a + 9$ D. $45 = 9 - b$

3. What number is 10 times greater than 13 ?
- A. 130 B. 3
 C. 23 D. 1,300

4. There were 24 adults and 3 children in line at a movie theater. How many times more adults were in the line than children ?
- A. 28 B. 36
 C. 7 D. 8

5. Noha sent 18 text messages a day. Ali sent 3 a day. How many times as many texts did Noha send than Ali ?
- A. 5 B. 4
 C. 3 D. 6

6. It takes Wael 7 oranges to make a small glass of orange juice. He uses 6 times as many for a large glass. How many oranges does he use for a large glass ?
- A. 14 B. 42
 C. 2 D. 68

7. Ola had 4 times as many dollars as her sister. Her sister has 3 dollars. How much money does Ola have ?
- A. 10 B. 11
 C. 12 D. 13

8. Hala was playing basketball. She made seven times as many shots as she missed. If she made 28 shots, how many shots did she miss ?
- A. 1 B. 2
 C. 3 D. 4

9. Which situation is an example of a multiplicative comparison ?
- A. When Osama arrived at work, there were 48 cars in the parking lot. When he left work, there were 3 fewer cars in the lot.
 B. Tony weighs 27 kilograms. His brother is 9 kilograms heavier.
 C. Nasser began his collection with 12 trading cards. After 1 month, there are triple the number of cards in his collection.
 D. Youssef read 15 books last year. Tarek read 5 books.

10. Hany is twice as old as his brother. His brother is 8 years old. Which two equations can be used to find Hany's age ?
- A. $2 + a = 8$ B. $2 \times a = 8$ C. $2 \times 8 = a$ D. $8 + 2 = a$ E. $8 + 8 = a$

Concept 1 Assessment || Unit 5



1. Put (✓) to the correct answer and (✗) to the incorrect answer.

- a. The multiplicative comparison statement for

5	5	5	5	5	5
---	---	---	---	---	---

 is «30 is 6 times greater than 5». []
- b. The multiplication equation for the comparison statement «60 is 10 times greater than 6» is $60 = 10 + 6$ []
- c. The answer of the equation $24 = 4 \times h$ is $h = 6$ []
- d. If $18 = a \times 2$, then $a = 6$ []
- e. 20 is 5 times smaller than 4. []
- f. 5 times greater than 3 is 15. []

2. Choose the correct answer.

- a. What number is 5 times greater than 4?
A. 54 B. 20 C. 45 D. 9
- b. 36 is 9 times more than what number?
A. 45 B. 27 C. 4 D. 369
- c. Mostafa and his sister peeled oranges. Mostafa peeled 6 oranges. Mostafa's sister peeled 3 times as many oranges as Mostafa. Which equation can be solved to find the number of oranges that Mostafa's sister peeled?
A. $6 + 3 = n$ B. $6 \times 3 = n$ C. $n + 3 = 6$ D. $n \times 3 = 6$
- d. A box has 8 green balls. The box has 6 times as many yellow balls as green balls.
How many yellow balls are in the box?
A. 2 B. 14 C. 48 D. 54
- e. A fish tank has 3 red fish and 17 times as many blue fish. How many blue fish are in the tank?
A. 20 B. 31 C. 17 D. 51
- f. A building is 20 meters tall. A bridge is 5 meters tall. The building is how many times taller than the bridge?
A. 3 B. 4 C. 15 D. 100

3. Complete.

- a. 10 times as 3 is _____
- b. 20 is _____ times greater than 5.
- c. 16 is 4 times as many as _____
- d. The comparison statement for the multiplication equation $30 = 5 \times 6$ is _____
- e. The multiplicative equation of $6 + 6 + 6 + 6 + 6 = 30$ is _____
- f. If $a \times 3 = 24$, then $a =$ _____

4. Match the cards that have the same meaning.

a. 24 is 6 times greater than 4

1. $5 = 5 \times 1$

b. 5 is 5 times greater than 1

2. $24 = 6 \times 4$

c. 35 is 7 times greater than 5

3. $16 = 8 \times 2$

d. 16 is 8 times greater than 2

4. $35 = 7 \times 5$ **5.** A fruit plate contains 21 grapes and the grapes is 3 times as many as dates.

Choose the best equation or number to complete the statement.

$$\begin{array}{l} a \times 21 = 3 \\ 3 \times a = 21 \\ 3 \times 21 = a \end{array}$$

6
7
63

6. A model is shown.

Write an equation which is the best represented by this model ?

7. The distance from Samir's house to the bank is 5 times the distance from his house to the museum. If his house is 20 kilometers from the museum, how many kilometers is his house from the bank.**8.** A truck driver delivers a total of 12 crates of fruits and vegetables to a store. The total number of crates of fruits and vegetables is 3 times as many as the number of crates of apples. How many crates of apples were delivered ?**9.** A hotel has 28 floors. The hotel has 4 times as many floors as the building next door. How many floors does the building next door have ?**10.** Mona has 4 apples. Her sister Hala has 20 apples. How many times more apples does Hala have ?**11.** A pet store sold 3 cats. They sold six times as many dogs as they sold cats. How many dogs did they sell ?**12.** Write the equation $5 + 5 + 5 + 5 = 20$ by using multiplication.

Concept

2

Properties and Patterns of Multiplication



Concept Overview

In concept 2 :

Properties and Patterns of Multiplication, students continue to work to build deep understanding of multiplication as well as procedural fluency. Their work in Primary 3 with multiplication facts takes on greater importance in Primary 4 as they begin to use those facts to solve more complex multiplication problems. Students are challenged to identify, describe, and apply patterns in multiplication - particularly when multiplying by multiples of 10 - to increase fluency and efficiency. Students also investigate and apply several properties of multiplication, including the Identity Property, the Zero Property, the Commutative Property, and the Associative Property. It is important that students build understanding that the properties are not just descriptive, but can be utilized to improve their efficiency and accuracy in multiplication.



Fast Fact

Properties and Patterns of Multiplication
Multiplication is commutative.
Multiplication is associative.
Multiplication is distributive.
Multiplication is closed.
Multiplication is commutative.
Multiplication is associative.
Multiplication is distributive.

Lesson No	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 3	5-4 Commutative Property of Multiplication	Array - Column - Commutative Property of Multiplication - Factor - Horizontal - Product - Row - Vertical	<ul style="list-style-type: none">Students will explain the Commutative Property of Multiplication.Students will apply the Commutative Property of Multiplication to solve problems.
	5-5 Patterns of Multiplying by 10s	Identity Property of Multiplication - Zero Property of Multiplication	<ul style="list-style-type: none">Students will apply the Identity Property of Multiplication to solve problems.Students will apply the Zero Property of Multiplication to solve problems.Students will identify patterns that occur when multiplying by 10, 100, and 1,000.
	5-6 Review Exploring Patterns in Multiplication	Multiples	<ul style="list-style-type: none">Students will apply place value concepts to multiply by multiples of 10, 100 and 1,000.Students will explain patterns when multiplying by multiples of 10, 100, and 1,000.
Lesson 4	5-7 Exploring More Patterns in Multiplication	Associative Property of Multiplication - Commutative Property of Multiplication - Parentheses	<ul style="list-style-type: none">Students will explain the Associative Property of Multiplication.Students will apply the Associative Property of Multiplication to solve problems.
	5-8 Applying Patterns in Multiplication	Decompose - Factors - Multiples	<ul style="list-style-type: none">Students will apply decomposing and the Associative Property of Multiplication to solve equations with multiples of 10, 100, or 1,000.

5-4 Commutative Property of Multiplication

5-5 Patterns of Multiplying by 10s

5-6 Review Exploring Patterns in Multiplication

Learn**Multiplication properties**

Multiplication properties are rules for multiplication that are always true. In this lesson, you will learn three properties of multiplication.

- Commutative Property.
- Identity Property.
- Zero Property.

Commutative Property of Multiplication

Sandy knitted 3 scarves. She used 2 balls of yarn for each scarf.

How many balls of yarn did she use in all?

You can use multiplication properties to help you find products.

**Multiply 3×2**

Commutative Property states that when you multiply two factors in any order the product is the same.

 3 rows of 2 $3 \times 2 = 6$ $3 \times 2 = 2 \times 3$	 2 rows of 3 $2 \times 3 = 6$
---	--

So, Sandy used 6 balls of yarn.

Identity Property of Multiplication

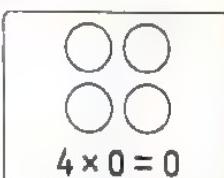
The Identity Property states that the product of 1 and any number equals that number.

$$3 \times 1 = 3$$

**Zero Property of Multiplication**

The Zero Property states that the product of zero and any number equals 0.

$$4 \times 0 = 0$$

**Notes for parents :**

- Using multiplication properties makes finding products easier.

Example 1

Apply the Commutative property of Multiplication to complete each equation.

a. $3 \times 8 = \underline{\quad} \times 3$

b. $10 \times \underline{\quad} = 7 \times 10$

c. $\underline{\quad} \times 5 = 5 \times 9$

d. $2 \times 11 = 11 \times \underline{\quad}$

Solution 

a. 8

b. 7

c. 9

d. 2

Example 2

Apply the Commutative property of Multiplication to find the unknown value.

a. $23 \times 7 = 7 \times a$

b. $5 \times b = 11 \times 5$

c. $9 \times 10 = m \times 9$

d. $k \times 6 = 6 \times 2$

Solution 

a. $a = 23$

b. $b = 11$

c. $m = 10$

d. $k = 2$

Example 3

Mr. Hany has 12 pens. Write an equation using the Commutative property of multiplication to describe two ways he can arrange his pens.

**Solution** 

• $3 \times 4 = 4 \times 3 = 12$

• $2 \times 6 = 6 \times 2 = 12$

Example 4

Look at the problems below. Solve them mentally.

a. 15×1

b. 1×23

c. 1×10

d. 632×1

e. 5×0

f. 171×0

g. 0×7

h. 0×329

Solution 

a. 15

b. 23

c. 10

d. 632

e. 0

f. 0

g. 0

h. 0

MATH IDEA

- When you multiply any number by 1, the product is equal to that number.

- When you multiply any number by 0, the product is 0.

 **check**

your understanding

Find the missing number. Name the property you used.

a. $\underline{\quad} \times 1 = 12$

b. $9 \times \underline{\quad} = 0$

c. $5 \times 6 = \underline{\quad} \times 5$

d. $\underline{\quad} \times 500 = 0$

e. $1 \times \underline{\quad} = 708$

f. $2 \times \underline{\quad} = 10 \times 2$

You may wish to ask your child questions such as the following as you observe your child at work :

- When you multiply with 1, which number is the product ?

- When you multiply any number by 0 , which number is the product ?

Learn**Multiplying by 10, 100 and 1,000**

You can use a basic fact and a pattern to find the product.

TH	H	T	O
			4
		4	0
	4	0	0
4	0	0	0

$$4 \times 1 = 4$$

[Think: Use the basic fact $4 \times 1 = 4$]

$$4 \times 10 = 40$$

[Put 1 zero at the end]

$$4 \times 100 = 400$$

[Put 2 zeroes at the end]

$$4 \times 1,000 = 4,000$$

[Put 3 zeroes at the end]

Look for a pattern of zeroes.

Example 5

Fill in the blanks below.

a. $6 \times 10 =$ _____

b. $2 \times 100 =$ _____

c. $7 \times 1,000 =$ _____

d. $21 \times 10 =$ _____

e. $50 \times 10 =$ _____

f. $70 \times 100 =$ _____

g. $90 = 9 \times$ _____

h. $170 =$ _____ $\times 17$

i. _____ $\times 1,000 = 50,000$

Solution

a. 60

b. 200

c. 7,000

d. 210

e. 500

f. 7,000

g. 10

h. 10

i. 50

**Check your understanding**

What is the value of each of the following.

a. $1,000 \times 5 =$ _____

b. _____ $= 100 \times 1$

c. $30 \times 10 =$ _____

d. $800 = 8 \times$ _____

e. $190 =$ _____ $\times 19$

f. $20,000 =$ _____ $\times 1,000$

Notes for parents :

- Let your child discover the pattern of zeroes when he/she multiply by 10, 100 and 1,000.

Learn**Multiplying by multiples of 10, 100 and 1,000**

Samy and his father are shopping at a music store. They are picking out some CDs to buy. The store displays their CDs in display racks. Each rack holds 300 CDs. How many CDs can 4 racks hold?



$$\text{Multiply } 4 \times 300 = n$$

300 is a multiple of 100. When multiplying a multiple of 10, 100 or 1,000, you can use basic facts and patterns of zeroes to help you multiply.

$$4 \times 3 = 12 \quad \text{--- basic fact.}$$

$4 \times 30 = 120$ The product has the same number of zeroes as the factor. Unless the basic fact has a zero in the product.

$$4 \times 300 = 1,200$$

Solution Four racks can hold 1,200 CDs.

How to multiply by a multiple of 10, 100 or 1,000 ?

$$\text{Multiply } 6 \times 700$$

Circle the fact.

$$6 \times 700$$

Find the product.

$$42$$

Count the zeroes in the factors.

$$2$$

Write that number of zeroes

$$42 \quad 00$$

in the product.

$$4,200$$

Add commas, if needed.

— In a short way, —

$$6 \times 700 = 4,200$$

$$\text{Multiply } 5 \times 9,000$$

Circle the fact.

$$5 \times 9,000$$

Find the product.

$$45$$

Count the zeroes in the factors.

$$3$$

Write that number of zeroes

$$45 \quad 000$$

in the product.

$$45,000$$

Add commas, if needed.

— In a short way, —

$$5 \times 9,000 = 45,000$$

- Let your child find the basic multiplication fact first. Then ask him/her to find the number of zeroes needed in the product and write the same number of zeroes to the right of the basic fact product.

Example 6

Use basic facts and patterns to find each product.

a. 5×7

5×70

5×700

$5 \times 7,000$

d. 9×40

b. 9×6

9×60

9×600

$9 \times 6,000$

e. 7×300

c. 5×8

5×80

5×800

$5 \times 8,000$

f. $8 \times 6,000$

Ask Yourself

- What basic fact can I use?
- How many zeroes should be in the product?

Solution

a. $5 \times 7 = 35$

$5 \times 70 = 350$

$5 \times 700 = 3,500$

$5 \times 7,000 = 35,000$

d. $9 \times 40 = 360$

b. $9 \times 6 = 54$

$9 \times 60 = 540$

$9 \times 600 = 5,400$

$9 \times 6,000 = 54,000$

e. $7 \times 300 = 2,100$

c. $5 \times 8 = 40$

$5 \times 80 = 400$

$5 \times 800 = 4,000$

$5 \times 8,000 = 40,000$

f. $8 \times 6,000 = 48,000$

Example 7

Fill in the blanks below.

a. $9 \times \underline{\quad} = 270$

c. $\underline{\quad} \times 6,000 = 18,000$

b. $\underline{\quad} \times 8 = 3,200$

d. $500 \times \underline{\quad} = 4,500$

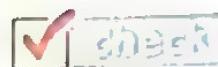
Solution

a. $9 \times 30 = 270$

c. $3 \times 6,000 = 18,000$

b. $400 \times 8 = 3,200$

d. $500 \times 9 = 4,500$



your understanding

Choose the correct answer.

a. What is 400×5 ?

- A. 20 B. 200
C. 2,000 D. 20,000

b. $\underline{\quad} \times 5 = 250$

- A. 5 B. 25
C. 50 D. 500

c. $300 \times \underline{\quad} = 1,800$

- A. 6 B. 60
C. 600 D. 6,000

Notes for parents:

Ask your child what basic fact can he/she use? and how many zeroes should be in the product?

Exercise**28****5-4 Commutative Property of Multiplication****5-5 Patterns of Multiplying by 10s****5-6 Review Exploring Patterns in Multiplication****REMEMBER****UNDERSTAND****APPLY****PROBLEM SOLVING****From the school book**

- 1.** Apply the Commutative Property of Multiplication to complete each equation.

a. $\blacksquare 5 \times 7 = \underline{\hspace{2cm}} \times 5$

b. $\blacksquare 20 \times \underline{\hspace{2cm}} = 6 \times 20$

c. $34 \times \underline{\hspace{2cm}} = 21 \times 34$

d. $6 \times 4 = 4 \times \underline{\hspace{2cm}}$

e. $23 \times 9 = \underline{\hspace{2cm}} \times 23$

f. $18 \times 7 = 7 \times \underline{\hspace{2cm}}$

g. $\underline{\hspace{2cm}} \times 15 = 15 \times 11$

h. $\underline{\hspace{2cm}} \times 3 = \underline{\hspace{2cm}} \times 9$

i. $4 \times \underline{\hspace{2cm}} = 5 \times \underline{\hspace{2cm}}$

j. $0 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \times 0$

- 2.** Apply the Commutative Property of Multiplication to find the unknown value.

a. $\blacksquare 33 \times 4 = 4 \times \underline{\hspace{2cm}}$

b. $\blacksquare b \times 9 = 9 \times \underline{\hspace{2cm}}$

c. $a \times 7 = 7 \times \underline{\hspace{2cm}}$

d. $5 \times 9 = 9 \times b \underline{\hspace{2cm}}$

e. $16 \times a = 7 \times 16 \underline{\hspace{2cm}}$

f. $5 \times 93 = b \times 5 \underline{\hspace{2cm}}$

g. $16 \times k = 11 \times 16 \underline{\hspace{2cm}}$

h. $3 \times m = 100 \times 3 \underline{\hspace{2cm}}$

i. $4 \times n = 7 \times 4 \underline{\hspace{2cm}}$

j. $1 \times 4 = 4 \times a \underline{\hspace{2cm}}$

- 3.** Mental Math Number Talk Look at the problems below. Solve them mentally.

a. $\blacksquare 5 \times 1$

b. $\blacksquare 12 \times 1$

c. $\blacksquare 672 \times 1$

d. $\blacksquare 8 \times 0$

e. $\blacksquare 16 \times 0$

f. $\blacksquare 758 \times 0$

g. 0×230

h. 1×356

i. 0×43

- 4.** What is the value of each of the following.

a. $5 \times 10 = \underline{\hspace{2cm}}$

b. $\blacksquare 100 \times 5 = \underline{\hspace{2cm}}$

c. $3 \times 1,000 = \underline{\hspace{2cm}}$

d. $\blacksquare \underline{\hspace{2cm}} = 1,000 \times 2$

e. $\blacksquare 700 = 7 \times \underline{\hspace{2cm}}$

f. $\blacksquare 9 \times \underline{\hspace{2cm}} = 9,000$

g. $19,000 = \underline{\hspace{2cm}} \times 19$

h. $\underline{\hspace{2cm}} \times 10 = 50$

i. $17 \times \underline{\hspace{2cm}} = 1,700$

j. Challenge: $\blacksquare 4 \times 10,000 = \underline{\hspace{2cm}}$

5. Use mental math to complete.

a. $8 \times 6 = \square$

$8 \times 60 = \square$

$8 \times 600 = \square$

$8 \times 6,000 = \square$

b. $4 \times 3 = \square$

$4 \times 30 = \square$

$4 \times 300 = \square$

$4 \times 3,000 = \square$

c. $6 \times 5 = \square$

$6 \times 50 = \square$

$6 \times 500 = \square$

$6 \times 5,000 = \square$

d. $5 \times 4 = \square$

$5 \times 40 = \square$

$5 \times 400 = \square$

$5 \times 4,000 = \square$

6. Use mental math. Write the basic fact and use a pattern to find the product.

a. 6×400

e. $7 \times 6,000$

b. $7 \times 4,000$

f. 6×90

c. 3×600

g. $3 \times 7,000$

d. 5×600

h. $3 \times 3,000$

7. Apply the strategies you have learned to solve the problems.

a. $\square 900 \times 3 = \underline{\hspace{2cm}}$

c. $\square 8,000 \times 5 = \underline{\hspace{2cm}}$

e. $\square 500 \times \underline{\hspace{2cm}} = 3,500$

g. $\underline{\hspace{2cm}} \times 900 = 1,800$

i. $400 \times \underline{\hspace{2cm}} = 3,600$

b. $\square 4 \times 40 = \underline{\hspace{2cm}}$

d. $\square 600 \times 3 = 3 \times \underline{\hspace{2cm}}$

f. $6,000 \times \underline{\hspace{2cm}} = 24,000$

h. $\underline{\hspace{2cm}} \times 70 = 280$

j. $3 \times 500 = \underline{\hspace{2cm}}$

8. Match equal products.

$3,000 \times 5$

5×300

50×3

30×100

30×5

$3 \times 1,000$

$5 \times 3,000$

3×500

Story Problems

9. Mr. Saleh has 24 beans. Write an equation using the commutative property of multiplication to describe two ways he can arrange his beans.
-
-



10. Bassem has 20 apples. write an equation using the commutative property of multiplication to describe two ways he can arrange the apples.
-
-



11. Noha has 18 stamps. Write an equation using the commutative property of multiplication to describe two ways she can arrange her stamps.
-
-



12. Ahmed has 48 toy cars and wants to display them in his room.
He wants to arrange them in equal rows and equal columns.
How can he display his cars ? Draw your solution.
-
-

13. The fastest man in the world is Usain Bolt. He can run about 44 kilometers per hour for short distances. One of the fastest cars in the world can move 10 times faster than Usain Bolt.
What is the speed of this car ?



- 14.** A music store displays CDs on racks. If each rack holds 200 CDs, how many CDs do 3 racks hold?

- 15.** At the video game store, one display shelf holds 200 CDs. One display case holds 300 CDs. Which holds more CDs, 5 shelves or 3 cases? Explain your thinking.

- 16.** At a computer super store, there are 40 display tables. Each table has 6 computer programs and 10 games. How many programs and games are there?

17. Write Math What's the Error?

Amal says that $5 \times 800 = 400$

Describe her error. Write the correct answer.

Challenge

- 18. Find each product.**

a. 20×40

b. 30×500

c. $80 \times 2,000$

d. 600×200

Enrich your knowledge

Multiply 30×50

Use a basic fact to solve

Factors	Product
---------	---------

$$3 \times 5 = 15 \quad \text{Basic fact}$$

$$30 \times 50 = 1,500$$

 1 zero 1 zero 2 zeroes



Multiple Choice Questions

Choose the correct answer.

1. $6 \times 5 =$

$\times 6$

A. 6

B. 5

C. 4

D. 3

2. $34 \times 0 =$

A. 1

B. 34

C. 0

D. 43

3. $1 \times 15 =$

A. 1

B. 15

C. 0

D. 16

4. $51 \times 100 =$

A. 5,100

B. 510

C. 51,000

D. 0

5. If $a \times 31 = 31 \times 9$, then $a =$

A. 7

B. 40

C. 31

D. 9

6. $301 \times$ $= 30,100$

A. 10

B. 100

C. 1,000

D. 0

7. $3 \times 500 =$

A. 3,500

B. 15,000

C. 1,500

D. 800

8. $\times 3,000 = 21,000$

A. 7

B. 70

C. 700

D. 7,000

9. $6 \times$ $= 420$

A. 7,000

B. 700

C. 70

D. 7

10. $20 \times 50 =$

A. 100

B. 1,000

C. 10,000

D. 10

11. Determine which choice best shows the commutative property of multiplication.

A. $3 \times 6 = 6 \times 3$

B. $3 \times 1 = 3$

C. $3 \times 60 = 180$

D. $3 \times 0 = 0$

12. Determine which choice best shows the identity property of multiplication.

A. $0 \times 6 = 0$

B. $1 \times 6 = 6$

C. $1 \times 6 = 6 \times 1$

D. $2 \times 6 = 6 \times 2$

13. Determine which choice best shows the zero property of multiplication.

A. $1 \times 5 = 5$

B. $2 \times 3 = 3 \times 2$

C. $6 \times 100 = 600$

D. $0 \times 5 = 0$

14. Hany bought 3 mobiles, if the price of each one is 1,000 pounds, then the total price of them equal _____ pounds.

A. 3×100

B. 30

C. $1,000 \times 3$

D. $1,000 + 3$

15. The drama club is selling tickets for the school musical. There are 4 shows. They have

500 tickets for each show. How many tickets are there to sell?

A. 200 tickets

B. 1,000 tickets

C. 900 tickets

D. 2,000 tickets

5-7 Exploring More Patterns in Multiplication

5-8 Applying Patterns in Multiplication

Learn! Associative property in multiplication

Suppose you make Super Cheesy Sandwiches for 4 people. Each person gets 2 sandwiches. Each sandwich has 2 slices of cheese.

How many slices of cheese will you need?
Here are some ways to find the product of $4 \times 2 \times 2$.

**Associative Property of Multiplication**

Associative Property states that when you group factors in different ways, the product is the same.

Use parentheses to group the factors you multiply first.



$$[4 \times 2] \times 2 = \boxed{\quad}$$

$$8 \times 2 = 16$$



$$4 \times [2 \times 2] = \boxed{\quad}$$

$$4 \times 4 = 16$$

Another Example :

Here are some ways to find $4 \times 2 \times 3$



$$[4 \times 2] \times 3$$

$$8 \times 3 = 24$$



$$4 \times [2 \times 3]$$

$$4 \times 6 = 24$$

Math tip

If there are no grouping symbols, you can choose any two factors to multiply first.

$$4 \times 2 \times 3$$

$$\text{Try } 4 \times 3 \text{ first} \\ 12 \times 2 = 24$$

Notes for parents :

- Your child may forget to multiply by the third factor.

To check, ask your child to group the factors in a different way and multiply again.

Example 1

Solve each problem. Multiply the part in the parentheses first:

a. $(3 \times 2) \times 9$

b. $10 \times (5 \times 3)$

Solution 

a. $(3 \times 2) \times 9 = 6 \times 9 = 54$

b. $10 \times (5 \times 3) = 10 \times 15 = 150$

Example 2

Place parentheses to show one way to find the product. Then show another way to use parentheses to find the product.

a. $3 \times 2 \times 5$

b. $4 \times 10 \times 2$

Solution 

a. $3 \times 2 \times 5 = [3 \times 2] \times 5$
 $= 6 \times 5 = 30$

Or $3 \times 2 \times 5 = 3 \times [2 \times 5]$
 $= 3 \times 10 = 30$

b. $4 \times 10 \times 2 = [4 \times 10] \times 2$
 $= 40 \times 2 = 80$

Or $4 \times 10 \times 2 = 4 \times [10 \times 2]$
 $= 4 \times 20 = 80$

Hint

If there are no parentheses, you can choose which pair of numbers to multiply first.

Example 3

Apply the associative property of multiplication to solve the problems. Rewrite the factors in another order if helpful:

a. $3 \times 7 \times 2$

b. $4 \times 8 \times 2$

Hint

It is helpful to use commutative property to multiply the small factors first.

Solution 

a. $3 \times 7 \times 2 = 3 \times 2 \times 7$ [Commutative property]
 $= [3 \times 2] \times 7$ [Associative property]
 $= 6 \times 7 = 42$

b. $4 \times 8 \times 2 = 8 \times 4 \times 2$ [Commutative property]
 $= 8 \times [4 \times 2]$ [Associative property]
 $= 8 \times 8 = 64$

Notes for parents :

- Ask your child to review the commutative property of multiplication. Ask him/her to predict whether it would make a difference which two factors they multiplied first in $8 \times 4 \times 2$.

Example 4

Noha bought 5 packs of water bottles. Each pack had 4 rows of 8 bottles each.
How many water bottles did Noha buy ?

**Solution**

$$\begin{aligned}\text{Noha bought} &= 5 \times 4 \times 8 \\ &= [5 \times 4] \times 8 \\ &= 20 \times 8 = 160 \text{ bottles.}\end{aligned}$$

Example 5

Use the grouping or associative property of multiplication and complete.

a. $[6 \times 2] \times 5 = 6 \times (\quad \times 5)$

b. $(20 \times \quad) \times 10 = 20 \times [15 \times 10]$

c. $7 \times [5 \times 2] = [7 \times \quad] \times 2$

d. $315 \times [16 \times 120] = (\quad \times \quad) \times 120$

Solution

a. $[6 \times 2] \times 5 = 6 \times [2 \times 5]$

b. $[20 \times 15] \times 10 = 20 \times [15 \times 10]$

c. $7 \times [5 \times 2] = [7 \times 5] \times 2$

d. $315 \times [16 \times 120] = [315 \times 16] \times 120$



Check & Extend your understanding

1. Find each product.

- $[4 \times 2] \times 6 =$ _____
- $5 \times [5 \times 2] =$ _____
- $8 \times 5 \times 2 =$ _____
- $3 \times 2 \times 8 =$ _____
- $2 \times 7 \times 4 =$ _____

2. Name two ways you can group $2 \times 5 \times 3$ to find the product.

Are the products the same? Explain.

- Ask your child, without multiplying, tell which is greater $(5 \times 7) \times 2$ or $(7 \times 2) \times 5$. Explain.

Learn**Decomposing and associative property of multiplication**

- You have learned before how to multiply by multiples of 10, 100 and 1,000 using a basic fact and a pattern of zeroes.
- Here you will use decomposing and associative property to solve problems.

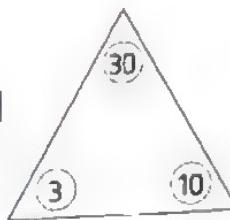
Example 6

Find the product: 8×30

Solution

$$\begin{aligned} 8 \times 30 &= 8 \times [3 \times 10] \\ (3) \times (10) &= [8 \times 3] \times 10 \\ &= 24 \times 10 \\ &= 240 \end{aligned}$$

[Decompose 30 to 3×10]
[Associative Property]

**Another Way**

$$\begin{array}{r} 8 \times 30 = 240 \\ \downarrow \\ 24 \end{array}$$

Example 7

Decompose each multiple of 10, 100 or 1,000 before multiplying.

Draw parentheses around the numbers you would multiply first, and then write the answer.

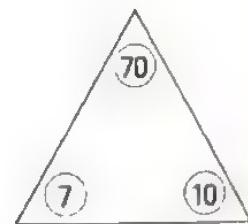
a. 2×70

b. 7×400

c. $4 \times 5,000$

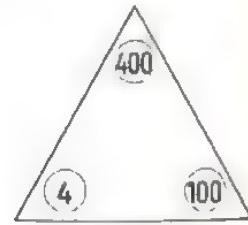
Solution

$$\begin{aligned} a. 2 \times 70 &= 2 \times [7 \times 10] \\ (7) \times (10) &= [2 \times 7] \times 10 \\ &= 14 \times 10 = 140 \end{aligned}$$



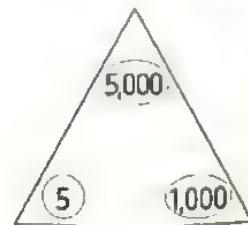
b. $7 \times 400 = 7 \times [4 \times 100]$

$$\begin{aligned} (4) \times (100) &= [7 \times 4] \times 100 \\ &= 28 \times 100 = 2,800 \end{aligned}$$



c. $4 \times 5,000 = 4 \times [5 \times 1,000]$

$$\begin{aligned} (5) \times (1,000) &= [4 \times 5] \times 1,000 \\ &= 20 \times 1,000 = 20,000 \end{aligned}$$

**Notes for parents :**

- The product has the same number of zeroes as the number of zeroes in the factor with zeroes unless the basic fact has a zero.

Example 8

Solve using a strategy you prefer.

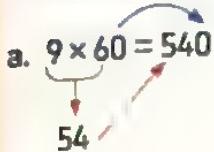
a. 9×60

b. 600×7

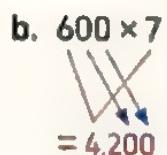
c. $4,000 \times 6$

Solution 

a. $9 \times 60 = 540$

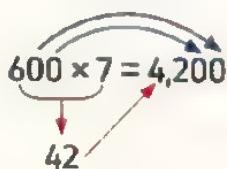


b. 600×7



c. $4,000 \times 6$
 $= [1,000 \times 4] \times 6$
 $= 1,000 \times [4 \times 6]$
 $= 1,000 \times 24$
 $= 24,000$

$600 \times 7 = 4,200$



**check** your understanding

Use decomposing and associative property to find each product.

a. $4 \times 40 =$ _____

b. $5 \times 500 =$ _____

c. $2 \times 8,000 =$ _____



Let your child solve using strategy he/she prefer.

**Exercise
29**

5-7 Exploring More Patterns in Multiplication
5-8 Applying Patterns in Multiplication

REMEMBER

KNOW IT

CARRY

PROBLEM SOLVING

1.1 From the school book

1. Solve each problem. Multiply the part in the parentheses first. Show your work.

a. $[2 \times 3] \times 4 =$ _____

c. $2 \times [3 \times 4] =$ _____

e. $[2 \times 6] \times 3 =$ _____

g. $[8 \times 5] \times 7 =$ _____

i. $8 \times [6 \times 5] =$ _____

b. $[5 \times 2] \times 3 =$ _____

d. $5 \times [2 \times 3] =$ _____

f. $9 \times [2 \times 3] =$ _____

h. $6 \times [2 \times 4] =$ _____

j. $(4 \times 5) \times 7 =$ _____

2. Applying the associative property of multiplication to solve the problems.

a. $3 \times 2 \times 5 =$ _____

c. $2 \times 9 \times 3 =$ _____

e. $4 \times 2 \times 3 =$ _____

g. $6 \times 5 \times 11 =$ _____

i. $9 \times 5 \times 6 =$ _____

b. $4 \times 6 \times 2 =$ _____

d. $3 \times 2 \times 3 =$ _____

f. $5 \times 4 \times 4 =$ _____

h. $8 \times 4 \times 5 =$ _____

j. $2 \times 5 \times 14 =$ _____

3. Place parentheses to show one way to find the product. Then show one other way to use parentheses to find the product.

a. $5 \times 4 \times 2 =$ _____

b. $3 \times 6 \times 2 =$ _____

c. $2 \times 3 \times 4 =$ _____

d. $8 \times 5 \times 10 =$ _____

e. $5 \times 2 \times 3 =$ _____

4. Write the missing number:

a. $(8 \times 4) \times 2 = 8 \times [\quad \times 2]$

c. $2 \times [6 \times 5] = [2 \times 6] \times$

e. $5 \times 14 \times 2 = [5 \times \quad] \times 14$

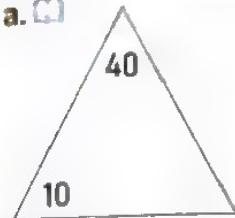
b. $5 \times [10 \times 2] = [5 \times \quad] \times 2$

d. $[3 \times 9] \times 5 = \quad \times [9 \times 5]$

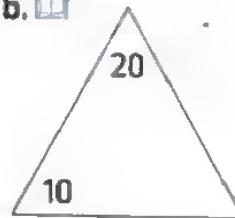
f. $3 \times 6 \times 2 = 6 \times [\quad \times 2]$

5. Write the missing factor in the box.

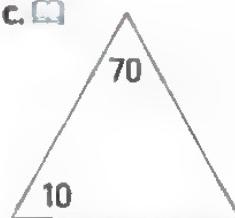
a.



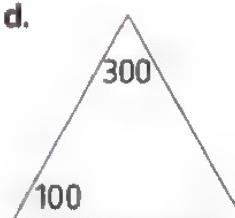
b.



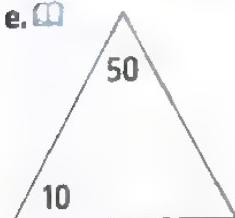
c.



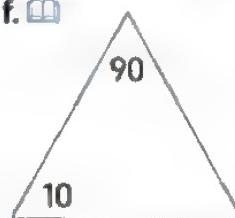
d.



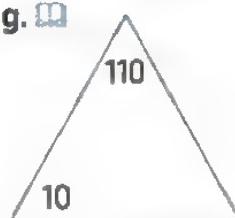
e.



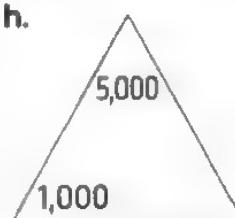
f.



g.



h.

**6. Write how many to make up each number.**

a. 30 = _____ Tens

b. 80 = _____ Tens

c. 160 = _____ Tens

d. 140 = _____ Tens

e. 120 = _____ Tens

f. 110 = _____ Tens

g. 600 = _____ Hundreds

h. 5,000 = _____ Thousands

i. 2,000 = _____ Thousands

j. 900 = _____ Hundreds

7. Multiplying by multiples 10, 100 and 1,000 Use decomposing and the Associative Property of Multiplication to solve each problem.

a. $7 \times 20 =$ _____

b. $5 \times 50 =$ _____

c. $4 \times 700 =$ _____

d. $3 \times 4,000 =$ _____

e. $9 \times 500 =$ _____

f. $2 \times 3,000 =$ _____

g. $800 \times 7 =$ _____

h. $50 \times 8 =$ _____

- 8.** Decompose each multiple of 10, 100 or 1,000 before multiplying. Draw parentheses around the numbers you would multiply first, and then write the answer.

a. $5 \times 70 =$ _____

b. $8 \times 30 =$ _____

c. $4 \times 40 =$ _____

d. $6 \times 600 =$ _____

e. $7 \times 7,000 =$ _____

- 9.** Solve using a strategy you prefer.

a. $6 \times 90 =$ _____

b. $7,000 \times 6 =$ _____

c. $600 \times 4 =$ _____

d. $4,000 \times 5 =$ _____

e. $900 \times 3 =$ _____

- 10.** Aisha bought 3 packs of water bottles. Each pack had 3 rows of 4 water bottles. How many water bottles did Aisha buy?



- 11.** Ahmed has 5 packs of gum. Each pack has 6 pieces. If Mona has the same amount as Ahmed, how much gum do Mona and Ahmed have?



12. Hany works 20 hours a week. If he makes L.E. 6 per hour.

- How much does Hany make in two weeks?

13. Angy runs 2 kilometers a day. If she runs five days a week.

- How many kilometers does she run in 10 weeks?



14. Patric rides his bicycle 4 km per day. If he rides every day for three weeks.

- How far will he ride?

15. Review each student's work. Then, answer

- the questions.

How is Heba's and Ashraf's work the same?

How are they different? Which student's strategy do you prefer? Why?

Heba's work

$$(4 \times 8) \times 10 \\ = 32 \times 10 \\ = 320$$

Ashraf's work

$$4 \times [8 \times 10] \\ = 4 \times 80 \\ = 320$$

16. Writing about Math

- Use what you have learned about the Associative Property of Multiplication to help Farouk solve the problem. Use words and numbers to explain your thinking.

Farouk is trying to solve the problem $2 \times 7 \times 4$

He starts by solving 2×7 and gets 14. Place parentheses to show how Farouk started this problem. $2 \times 7 \times 4$

Next, he writes 14×4 but he does not know how to solve that multiplication problem. Can you show Farouk another way to solve the problem?

Challenge

17. Marawan's mom gives him L.E. 5 every day for lunch at school. If he only pays L.E. 3 for

- lunch, how much will he save in 10 weeks if he goes to school five days weekly?

Multiple Choice Questions

D

Choose the correct answer.

1. $2 \times [5 \times 4] = [2 \times \dots] \times 4$

- A. 2
- B. 4
- C. 5
- D. 40

2. $3 \times 50 = \dots$

- A. $3 \times 40 \times 10$
- B. $3 + 50$
- C. $3 \times 5 \times 0$
- D. $3 \times 5 \times 10$

3. $3,000 \times 5 = \dots$

- A. 15,000
- B. 35,000
- C. 3,005
- D. 1,500

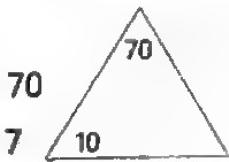
4. $600 = \dots$ Hundreds

- A. 60
- B. 600
- C. 6
- D. 60,000

5. The missing factor in the box

equals \dots

- A. 7,000
- B. 70
- C. 700
- D. 7



6. $2 \times 3 \times 4 = \dots$

- A. 234
- B. 9
- C. 24
- D. 10

7. $[2 \times 6] \times 3 = \dots$

- A. $2 \times [6 + 3]$
- B. $[2 + 6] \times 3$
- C. 63
- D. 12×3

8. Marawan bought 5 packs of water bottles. Each pack had 2 rows of 4 water bottles. How many water bottles did Marawan buy?

- A. 8
- B. 10
- C. 40
- D. 100

9. $5,000 \times 2 = \dots$

- A. 1,000
- B. 2 Thousands
- C. 10 Hundreds
- D. 10 Thousands

10. $[300 \times 7] \times 0 = \dots$

- A. 2,100
- B. 3,070
- C. zero
- D. 307

11. Khalid used the Associative Property to rewrite and correctly evaluate this expression:
 $6,000 \times 7$

Which equation was most likely part of Khalid's work?

- A. $1,000 \times 13 = 1,300$
- B. $1,000 \times 42 = 4,200$
- C. $1,000 \times 13 = 13,000$
- D. $1,000 \times 42 = 42,000$

Concept 2 Assessment | Units



1. Put (✓) to the correct answer and (✗) to the incorrect answer.

- a. $3 \times 8 = 8 \times 3$ is called a Commutative property of Addition. []
- b. The product of 1 and any number is the same number. []
- c. $1,000 \times 2 = 2$ Hundreds. []
- d. $(3 \times 5) \times 6 = 3 \times (5 \times 6)$. []
- e. $500 = 5$ Hundreds. []
- f. $5 \times 200 = 10$ Thousands. []

2. Choose the correct answer.

- a. $3 \times 7 = \underline{\hspace{2cm}} \times 3$
 - A. 3
 - B. 7
 - C. 10
 - D. 37
- b. $29 \times 0 = \underline{\hspace{2cm}}$
 - A. zero
 - B. 29
 - C. 290
 - D. 209
- c. $345 \times \underline{\hspace{2cm}} = 345,000$
 - A. 10
 - B. 100
 - C. 1,000
 - D. 1
- d. $3 \times 500 = \underline{\hspace{2cm}}$
 - A. 3,500
 - B. $3 \times 5 \times 100$
 - C. 15×10
 - D. 15,000
- e. $[2 \times 3] \times 4 = \underline{\hspace{2cm}}$
 - A. 234
 - B. 64
 - C. $[2 + 3] \times 4$
 - D. $2 \times [3 \times 4]$
- f. Which statement best describes the pattern of products created by multiplying one-digit whole numbers by 10 ?
 - A. The product always has a 0 in the Ones place.
 - B. The product always has a 0 in the Tens place.
 - C. The product is always a three-digit number.
 - D. The product is always a one-digit number.

3. Complete.

- | | |
|---|--|
| <ul style="list-style-type: none"> • a. $4 \times 1,000 = \underline{\hspace{2cm}}$ c. $35 \times \underline{\hspace{2cm}} = \text{zero}$ e. $160 = \underline{\hspace{2cm}} \text{ Tens.}$ | <ul style="list-style-type: none"> b. $\underline{\hspace{2cm}} \times 15 = 15 \times 11$ d. $[2 \times 3] \times 4 = \underline{\hspace{2cm}}$ f. $8 \times 300 = 8 \times 3 \times \underline{\hspace{2cm}}$ |
|---|--|

4. Compare. Write ($>$, $<$ or $=$).

a. $[5 \times 7] \times 2$ $5 \times [7 \times 2]$

c. 15,000 150 Hundreds

b. $6 + 0$ 6×0

d. 3×30 9×100

5. Find the unknown value.

a. $a \times 7 = 7 \times 8$

c. $(2 \times 7) \times 5 = 2 \times [b \times 5]$

b. $4 \times n = 7 \times 4$

d. $3 \times 500 = 3 \times 5 \times m$

6. Solve using a strategy you prefer.

a. $5,000 \times 6$

b. 4×80

7. Applying the associative property of multiplication to solve the problems.

a. $2 \times 9 \times 3$

b. $2 \times 5 \times 14$

8. Ashraf runs 3 kilometers a day. If he runs five days a week. How many kilometers does he run in 10 weeks?

9. Youssef has 20 apples. Write an equation using commutative property of multiplication to describe two ways he can arrange the apples.

10. Salwa bought 3 packs of water bottles. Each pack had 4 rows of 2 water bottles. How many water bottles did Salwa buy?

11. Solve mentally.

a. 12×1

b. 16×0

c. 0×758

d. 1×251

12. Solve each problem. Multiplying the part in the parentheses first.

a. $10 \times [6 \times 5]$

b. $[3 \times 2] \times 7$

c. $(24 \times 1) \times 0$

d. $[0 \times 971] \times 1$

Unit Five Assessment



1. Put (✓) to the correct answer and (✗) to the incorrect answer.

- a. 7 times greater than 2 is 14 ()
- b. If $20 = A \times 4$, then $A = 16$ ()
- c. The multiplicative comparison statement for $\boxed{7} \boxed{7} \boxed{7} \boxed{7} \boxed{7} \boxed{7}$ is "35 is 5 times greater than 7" ()
- d. $2 \times [7 \times 4] = [2 \times 7] \times 4$ ()
- e. $7,000 = 7$ Hundreds. ()
- f. $3 \times 500 = 3 \times 5 \times 1,000$ ()

2. Choose the correct answer.

- a. $5 \times 9 = 9 \times$
A. 5 B. 9 C. 14 D. 4
- b. $375 \times$ $\underline{\quad}$ $= 37,500$
A. 10 B. 100 C. 1,000 D. 10,000
- c. $0 \times 25 =$
A. 25 B. 1 C. 0 D. 250
- d. Which equation would be the best to include in an explanation of the Commutative Property of Multiplication?
A. $3 \times 5 = 5 \times 3$ B. $4 \times 16 = [4 \times 11] + [4 \times 5]$
C. $[6 \times 4] \times 2 = 6 \times [4 \times 2]$ D. $5 \times 1 = 5$
- e. Which equation would be the best to include in an explanation of the Associative Property of Multiplication?
A. $(9 \times 12) \times 0 = 0$ B. $[4 \times 6] \times 1 = 4 \times 6$
C. $[3 \times 7] \times 2 = 3 \times [7 \times 2]$ D. $7 \times 6 = 6 \times 7$
- f. A box has 7 green balls. The box has 5 times as many yellow balls as green balls.
How many yellow balls are in the box?
A. 12 B. 35 C. 2 D. 75

3. Complete

- a. 30 is times greater than 6.

b. The multiplicative equation of $8 + 8 + 8 + 8 + 8 = 40$ is

c. $7 \times 100 =$ d. $3,200 =$ Hundreds.

e. $\times 17 =$ zero f. If $A \times 7 = 21$, then $A =$

4. Compare. Write ($>$, $<$ or $=$).

- a. 3×50 $3 \times 5 \times 10$ b. $14,000$ 14 Hundreds
c. 7×5 5×7 d. $3 + 0$ 3×0

5. A model is shown.

54

Write an equation which is the best represented by this model.



6. Write the equation $3 + 3 + 3 + 3 = 12$ by using multiplication.

7. Sameh has 5 apples. His brother Maged has 20 apples. How many times more apples does Maged have ?

8. A hotel has 28 floors. The hotel has 7 times as many floors as the building next door. How many floors does the building next door have ?

9. Mina runs 5 kilometers a day. If he runs 6 days a week. How many kilometers does he run in 7 weeks ?

10. Manal has 30 pens. Write an equation using a Commutative Property of Multiplication to describe two ways she can arrange the pens.

11. Apply the properties of multiplication to solve the problems.

a. $3 \times 2 \times 4$

b. $5 \times 7 \times 2$

12. Find the unknown value.

a. $7 \times 5,000 = 7 \times 5 \times a$

b. $[3 \times 7] \times 6 = 3 \times [b \times 6]$

c. $9 \times 4 = 4 \times m$

d. $248 \times n = \text{zero}$

Theme 2 | Mathematical Operations and Algebraic Thinking

UNIT

6

Factors and Multiples

» **Concept 1 : Understanding Factors**

■ **Concept 2 : Understanding Multiples**



Fast Fact

Pandas are **BIG** eaters - every day they fill their tummies for up to 12 hours, shifting up to 12 kilograms of bamboo!

About how many kilograms of bamboo does a panda eat in 2 days, 3 days, 4 days, and a week?

Concept

1

Understanding Factors



Concept Overview

In concept 1:

Understanding Factors, students explore the concept of factors. They use their knowledge of multiplication facts, observation of patterns in skip counting, and number sense to build critical understanding of the relationship between numbers and their factors. They identify factors, common factors, and greatest common factors between two numbers. This work prepares them for working with larger numbers and fractions.



Fast Fact

Hippos are considered the second largest land animal on Earth (first place goes to the elephant!). Males measures 1 m and a half tall, and can weigh up 3,200 kg. That's as much as three small cars!



Lesson No.	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 1	6-1 Identifying Factors of Whole Numbers	Factor – Factor pairs	<ul style="list-style-type: none">Students will define factors of a whole number.Students will find all factors of a given number between 0 and 100.Students will explain patterns they observe in numbers that have 2, 5 or 10 as factors.
	6-2 Prime and Composite Numbers	Composite – Factors – Prime	<ul style="list-style-type: none">Students will find all factors of a given number between 0 and 100.Students will explain patterns they observe in numbers that have 3, 6 or 9 as factors.Students will determine if a number is prime or composite.
Lesson 2	6-3 Greatest Common Factor	Common factor – Factor – Greatest common factor (GCF)	<ul style="list-style-type: none">Students will find common factors between two whole numbers.Students will identify the greatest common factor between two whole numbers.



6-1 Identifying Factors of Whole Numbers

6-2 Prime and Composite Numbers

Learn Identify factors of whole numbers

A factor is a number multiplied by another number to get a product.

► Examples:

$$\begin{array}{rcl} 2 \times 9 = 18 & | & 1 \times 7 = 7 \\ \downarrow \quad \uparrow \quad \downarrow & & \downarrow \quad \uparrow \quad \downarrow \\ \text{factor} \times \text{factor} = \text{Product} & & \text{factor} \times \text{factor} = \text{Product} & & \text{factor} \times \text{factor} = \text{Product} \end{array}$$

Many numbers can be broken into factors in different ways.

Arrays.

$$16 = 4 \times 4$$

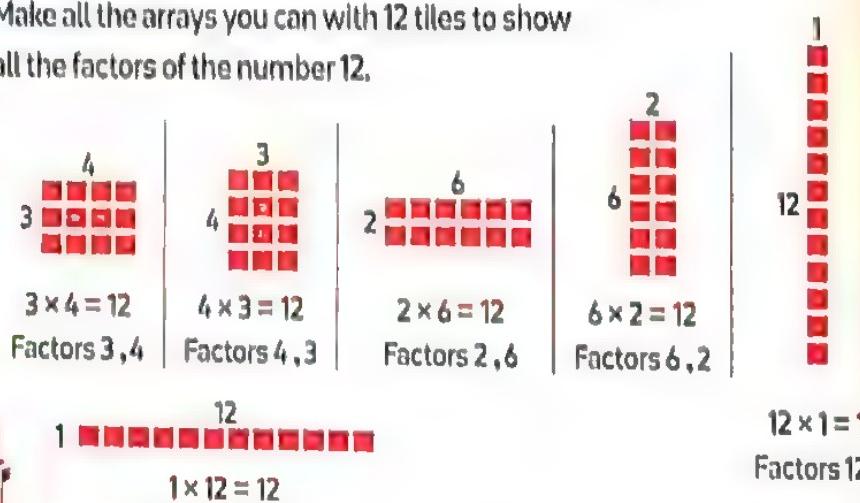
$$16 = 2 \times 8$$

$$16 = 1 \times 16$$

Enas has 12 pots of flowers for her box garden.

How many ways can she arrange them in equal rows?

Make all the arrays you can with 12 tiles to show all the factors of the number 12.



$$1 \quad \boxed{12}$$

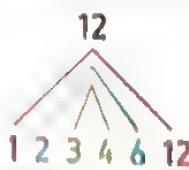
$$1 \times 12 = 12$$

Factors 1,12

So, Enas can arrange her pots in 6 different ways.

The factors of 12 are 1, 2, 3, 4, 6 and 12. There are 6 factors or 3 factor pairs.

Factor tree



Factor rainbow



Factor T-chart

1	12
2	6
3	4

Notes for parents :

Let your child find the factors of 16. Ask him/her to draw arrays to help finding factors and help him/her show the factors by factor tree, factor rainbow and factor T-chart.

Example 1

Make as many arrays as you can to show all factors of 36. Show the factors on factor tree, factor rainbow, and factor T-chart.

Solution

$$1 \times 36 = 36$$



This array has a length of 36 and a width of 1. So, 36 and 1 are factors of 36.

$$2 \times 18 = 36$$



This array has a length of 18 and a width of 2.
So, 18 and 2 are factors of 36.

$$3 \times 12 = 36$$



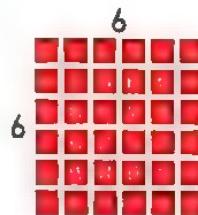
This array has a length of 12 and a width of 3.
So, 12 and 3 are factors of 36.

$$4 \times 9 = 36$$



This array has a length of 9 and a width of 4.
So, 9 and 4 are factors of 36.

$$6 \times 6 = 36$$

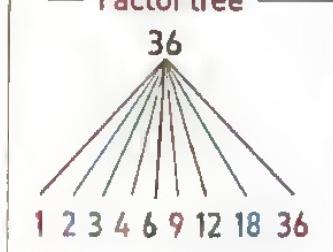


This array has a length of 6 and a width of 6.
So, 6 and 6 are factors of 36.

So, The factors of 36 are 1, 2, 3, 4, 6, 9, 12, 18 and 36.

Are there other ways the arrays can be formed and still show the same factors? Explain.

Factor tree



Factor rainbow



Factor T-chart

1	36
2	18
3	12
4	9
6	6

- Reinforce your child's understanding by finding more factors of numbers.

How can you find all the factors of a number?

Helpfull Hint:

1	Is a factor of any number. Every number will have a factor pair of 1 and itself.	Examples 8, 24, 48
2	Is a factor, if the digit in the ones place is even [The ones digit is : 0, 2, 4, 6 or 8].	9, 18, 24
3	Is a factor, if the sum of the digits is a number that exists when skip counting by 3s.	8, 12, 16
4	Is a factor, if the number is existing when skip counting by 4s.	5, 15, 20
5	Is a factor, if the ones digit is 0 or 5.	12, 18, 24
6	Is a factor, if the number is even and has a factor 3.	9, 27, 45
9	Is a factor, if the sum of the digits is a number that exists when skip counting by 9s.	20, 50, 100
10	Is a factor, if the ones digit is 0.	

Example 2

Answer the following questions.

- Is 3 a factor of 29 ? Explain how do you know.
- Is 9 a factor of 54 ? Explain how do you know.
- Is 6 a factor of 48 ? Explain how do you know.

Solution

- No, because $2 + 9 = 11$ and 11 is a number does not exist when skip counting by 3s.
- Yes, because $5 + 4 = 9$ and 9 is a number existing when skip counting by 9s.
- Yes, because 48 is even and $4 + 8 = 12$ and 12 is a number existing when skip counting by 3s.

Notes for parents :

- Ask your child more questions of factors such as . Is 2 a factor of 14 ? Is 5 a factor of 61 ? and more questions, then let your child explain how did he/she know.

Example 3

Find all the factors of 48.

Solution

To find all the factors of a number, make an organized list of multiplication sentences. Write sentences until your factors start to repeat. [Ignore any sentences that won't work]. Then list the factors. Find all the factors of 48.

$48 = 1 \times 48$ (*1 is a factor of every whole number*)

2×24 (*48 is even*)

3×16 (*$4 + 8 = 12$ and 12 is existing when skip counting by 3s.*)

4×12 (*48 is existing when skip counting by 4s.*)

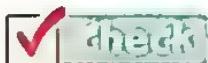
~~5 ×~~

6×8 (*48 is even, and 3 is a factor*)

~~7 ×~~

8×6 (*← STOP! Repeat of 6×8 .*)

The factors of 48 are 1, 2, 3, 4, 6, 8, 12, 16, 24 and 48. There are 5 factor pairs.


check your understanding

1. Find the factors of 15 and show the factors on factor tree, factor rainbow and factor T-chart.

2. Choose the correct answer.

- 5 is a factor of _____

A. 50	B. 51	C. 52	D. 53
-------	-------	-------	-------
- Which number is a factor of 20 ? _____

A. 6	B. 10	C. 30	D. 40
------	-------	-------	-------
- The number 11 has _____ factors.

A. 2	B. 3	C. 4	D. 5
------	------	------	------
- The number 32 has _____ factors.

A. 4	B. 6	C. 8	D. 10
------	------	------	-------
- Which is the factor of every number ?

A. 0	B. 1	C. 2	D. 10
------	------	------	-------

- Ask your child to find all the factors of 72 by using the helpful hint to check all the factors.

Learn**Prime and composite numbers**

You can use the factors of a number to tell if it is a prime number or a composite number.

► A **Prime number** is a whole number that has exactly two different factors, 1 and itself.

► **Example :**

5 is an example of a prime number. It has only two different factors, 1 and 5. It has only one rectangular array.

$$\blacksquare \blacksquare \blacksquare \blacksquare \quad 1 \times 5 = 5$$

► More examples of prime numbers

17, 29, 31

Number	Factors
17	1, 17
29	1, 29
31	1, 31

► A **Composite number** is a whole number greater than 1 that has more than two factors.

► **Example :**

6 is an example of a composite number. Its factors are 1, 2, 3 and 6. It has more than one rectangular array.

$$\blacksquare \blacksquare \blacksquare \blacksquare \blacksquare \quad 1 \times 6 = 6$$

$$\blacksquare \blacksquare \blacksquare \quad 2 \times 3 = 6$$

► More examples of composite numbers

15, 18, 25

Number	Factors
15	1, 3, 5, 15
18	1, 2, 3, 6, 9, 18
25	1, 5, 25

Remarks

- The number 1 is neither prime nor composite because it has only ONE factor.
- 2 is the smallest prime number.
- All prime numbers are odd numbers except 2.
- The following table shows the prime numbers which lie between 1 and 100 :

2	3	5	7	11	13	17	19	23
29	31	37	41	43	47	53	59	61
	67	71	73	79	83	89	97	

Notes for parents :

- Use the 100-chart to check the prime and the composite numbers and let your child identify how he/she knew the difference between them.

Example 4

Check each of the following numbers if it is a prime or a composite number.

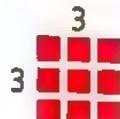
a. 9

b. 13

c. 19

Solution

a. 9 has more than two factors [1, 3, 9]



So, 9 is a composite number.

b. 13 has exactly two different factors 1, 13



So, 13 is a prime number.

c. 19 has exactly two different factors 1, 19



So, 19 is a prime number.

**Check****your understanding**

Choose the correct answer.

a. _____ is a prime number.

A. 9

B. 16

C. 19

D. 21

b. _____ is a prime number.

A. 1

B. 6

C. 7

D. 12

c. _____ isn't a prime number.

A. 1

B. 3

C. 5

D. 7

d. _____ is a composite number.

A. 1

B. 3

C. 13

D. 15

e. _____ isn't a composite number.

A. 11

B. 12

C. 14

D. 20

f. The smallest prime number is _____.

A. 0

B. 1

C. 2

D. 3

g. The smallest odd prime number is _____.

A. 0

B. 1

C. 2

D. 3

h. The prime number between 44 and 50 is _____.

A. 45

B. 46

C. 47

D. 49

- Give your child a group of numbers and ask him/her to identify the prime numbers and the composite numbers.

Exercise**30****6-1 Identifying Factors of Whole Numbers
6-2 Prime and Composite Numbers**

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

First : Exercises on factors

1. Draw arrays for each number to show all the factors.

a. 9

b. 16

c. 24

d. 30

- 2.** Determine if the given number has 2 as a factor, 5 as a factor, or 10 as a factor.
Circle yes or no.

	Number	Is 2 a factor?		Is 5 a factor?		Is 10 a factor?	
a.	70	Yes	No	Yes	No	Yes	No
b.	15	Yes	No	Yes	No	Yes	No
c.	26	Yes	No	Yes	No	Yes	No
d.	17	Yes	No	Yes	No	Yes	No

- 3.** Highlight or circle the factors of the numbers listed.

- | | |
|---|--------------------------------|
| a. 15: 2 5 10
c. 12: 2 5 10
e. 36: 2 5 10 | b. 30: 2 5 10
d. 25: 2 5 10 |
|---|--------------------------------|

- 4.** Circle the factors of the numbers listed.

- | |
|---|
| a. 16: 1 2 3 4 5 6 7 8 9 10
b. 20: 1 2 3 4 5 6 7 8 9 10
c. 28: 1 2 3 4 5 6 7 8 9 10
d. 56: 1 2 3 4 5 6 7 8 9 10
e. 63: 1 2 3 4 5 6 7 8 9 10 |
|---|

- 5.** Complete with "is a factor of" or "is not a factor of":

- | | |
|---|---|
| a. 7 _____ 14
c. 2 _____ 100
e. 6 _____ 96
g. 4 _____ 88
i. 19 _____ 19 | b. 5 _____ 52
d. 3 _____ 36
f. 1 _____ 67
h. 9 _____ 27
j. 8 _____ 40 |
|---|---|

- 6.** Answer the following problems.

- a. Is 2 a factor of 23? How do you know?

b. Is 5 a factor of 35? How do you know?

c. Is 6 a factor of 84? How do you know?

d. Is 3 a factor of 53? How do you know?

e. Is 4 a factor of 32? How do you know?

f. Is 7 a factor of 48? How do you know?

g. Is 9 a factor of 63? How do you know?

h. Is 1 a factor of 57? How do you know?

i. Is 8 a factor of 64? How do you know?

7. Complete the following.



a. $8 = 1 \times \underline{\hspace{2cm}} = 2 \times \underline{\hspace{2cm}}$

The factors are: _____

b. $25 = 1 \times \underline{\hspace{2cm}} = 5 \times \underline{\hspace{2cm}}$

The factors are: _____

c. $20 = 1 \times \underline{\hspace{2cm}} = 2 \times \underline{\hspace{2cm}} = 4 \times \underline{\hspace{2cm}}$

The factors are: _____

d. $33 = 1 \times \underline{\hspace{2cm}} = 3 \times \underline{\hspace{2cm}}$

The factors are: _____

e. $42 = 1 \times \underline{\hspace{2cm}} = 2 \times \underline{\hspace{2cm}} = 3 \times \underline{\hspace{2cm}} = 6 \times \underline{\hspace{2cm}}$

The factors are: _____

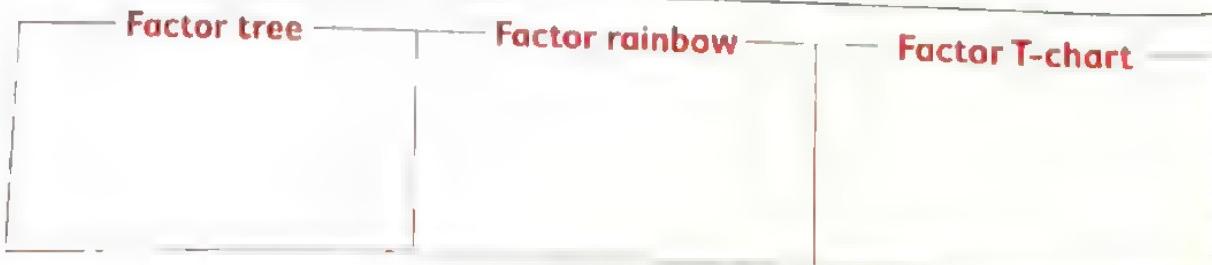
f. $100 = 1 \times \underline{\hspace{2cm}} = 2 \times \underline{\hspace{2cm}} = 4 \times \underline{\hspace{2cm}} = 5 \times \underline{\hspace{2cm}} = 10 \times \underline{\hspace{2cm}}$

The factors are: _____

8. Find all the factors of the following and create a factor tree, a factor rainbow and a factor T-chart.

a. 12. There are 3 factor pairs.

Factors are: _____



- b. 20. There are 3 factor pairs.

Factors are :—

Factor tree	Factor rainbow	Factor T-chart

- c. 40. There are 4 factor pairs.

Factors are :—

Factor tree	Factor rainbow	Factor T-chart

- d. 36. There are 5 factor pairs.

Factors are :—

Factor tree	Factor rainbow	Factor T-chart

9. List all the factors of each number. You may create a factor tree, a factor rainbow or a factor T-chart.

a. 14 _____

b. 16 _____

c. 38 _____

d. 25 _____

e. 54 _____

f. 21 _____

g. 48 _____

h. 19 _____

i. 13 _____

j. 35 _____

k. 49 _____

l. 64 _____

10. Factor Riddles. Guess the number.

- a. The number is an even number between 1 and 10. Some of its factors include 1, 2 and 3.
What number is it?
- b. The number is an even number between 20 and 30. Some of its factors include 1, 2, 4, 7 and 14. What number is it?
- c. The number is an even number greater than 10. It has 10 as a factor. It is less than 30.
What number is it?
- d. The number is an even number greater than 40. It has 10 as a factor. It is less than 60.
What number is it?
- e. The number is a two-digit number. It has 3 as a factor. Its tens digit is less than its ones digit. One of its factor pairs is 4 and 6. What number is it?
- f. The number is a two-digit number. It has 5 as a factor. Its tens digit is less than its ones digit. One of its factor pairs is 5 and 7. What number is it?

11. Writing About Math : Write three numbers that have 2, 5 and 10 as factors.

What do the three numbers you wrote have in common?

Second : Exercises on prime and composite numbers**12. Complete with "Prime" or "Composite".**

a. 2 is

b. 4 is

c. 29 is

d. 3 is

e. 5 is

f. 6 is

g. 7 is

h. 11 is

i. 13 is

j. 12 is

k. 16 is

l. 23 is

13. Complete.

- a. _____ is the only even prime number.
- b. The prime number has two different factors which are _____ and _____.
- c. The 2-digit prime number which is less than 13 is _____.
- d. The prime numbers between 60 and 70 are _____.
- e. The number 37 has _____ factors and it is a _____ number.
- f. The number 15 is a _____ number because it has _____ factors.

14. List all the factors of each number. Then, write if the number is prime or composite.

- | | |
|--------------|--------------|
| a. 14 _____ | b. 19 _____ |
| c. 23 _____ | d. 37 _____ |
| e. 18 _____ | f. 32 _____ |
| g. 21 _____ | h. 45 _____ |
| i. 50 _____ | j. 59 _____ |
| k. 22 _____ | l. 61 _____ |
| m. 31 _____ | n. 46 _____ |
| o. 44 _____ | p. 29 _____ |

15. Prime Numbers less than 100. Identify all of the prime numbers less than 100.

• Use skip counting and factor patterns to help you eliminate composite numbers.

1. Circle 2 and cross out all other numbers that you say when you skip count by 2s.
2. Circle 3 and cross out all other numbers that you say when you skip count by 3s.
3. Circle 5 and cross out all other numbers that you say when you skip count by 5s [some are already crossed out].
4. Circle 7 and cross out all other numbers that you say when you skip count by 7s.

5. Circle all numbers that remain except for 1.

When you are finished, the circled numbers are prime and the crossed out numbers are composite.

91	92	93	94	95	96	97	98	99	100
81	82	83	84	85	86	87	88	89	90
71	72	73	74	75	76	77	78	79	80
61	62	63	64	65	66	67	68	69	70
51	52	53	54	55	56	57	58	59	60
41	42	43	44	45	46	47	48	49	50
31	32	33	34	35	36	37	38	39	40
21	22	23	24	25	26	27	28	29	30
11	12	13	14	15	16	17	18	19	20
1	2	3	4	5	6	7	8	9	10

- 16. Writing About Math.** How do you decide if a number is prime or composite?

- 17. What's the Error.** Ashraf listed the first five prime numbers as 2, 3, 7, 11 and 13.
- Describe his error. Write the correct answer.

- 18. Writing About Math.** The seats on the new ferry will be arranged in a rectangle. Is it better for the ferry to have 48 seats or 53 seats? How do you know? Would 49 seats be a good idea? Use numbers, words and pictures to explain your thinking.



Challenge

- 19.** Write all prime numbers which are less than 30

- 20.** Write all prime numbers which are between 46 and 62

- 21.** Write all composite numbers which are between 5 and 23

Multiple Choice Questions

Choose the correct answer.

1. All the factors of 25 are

- A. 1, 5, 20
- B. 1, 20, 25
- C. 5, 20, 25
- D. 1, 5, 25

3. 4 is a factor of _____

- A. 37
- B. 38
- C. 39
- D. 40

5. Which of the following is a factor
of 10? _____

- A. 30
- B. 20
- C. 15
- D. 5

7. The factor pair _____ is for the number 21

- A. 2 and 10
- B. 2 and 1
- C. 3 and 7
- D. 5 and 4

9. 18 has _____ factors.

- A. 2
- B. 4
- C. 6
- D. 8

11. Which of the following is a composite
number? _____

- A. 1
- B. 31
- C. 33
- D. 43

13. All the following numbers are composite
except _____

- A. 66
- B. 67
- C. 68
- D. 69

2. All the factors of _____ are 1, 2, 3, 6,

- 9 and 18
- A. 9
- B. 18
- C. 36
- D. 54

4. _____ is a factor of 20

- A. 3
- B. 5
- C. 8
- D. 40

6. The factor pair 3 and 8 is for
the number _____

- A. 5
- B. 11
- C. 12
- D. 24

8. 23 has _____ factor pair.

- A. 1
- B. 2
- C. 3
- D. 4

10. Which of the following is a prime
number? _____

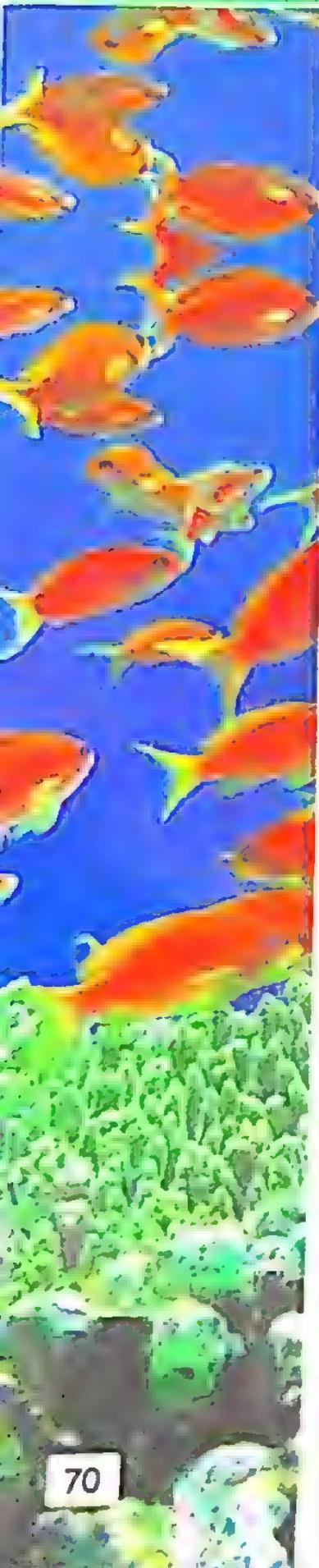
- A. 1
- B. 3
- C. 9
- D. 15

12. Which of the following is NOT a prime
number? _____

- A. 2
- B. 5
- C. 7
- D. 9

14. Which statement is true? _____

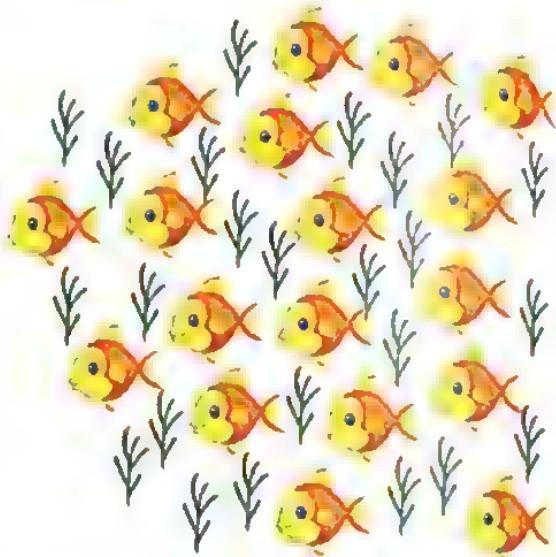
- A. 1 is a factor of only odd numbers.
- B. 1 is not a factor of any number.
- C. 1 is a factor of every number.
- D. 1 is a factor of only 0.



6-3 Greatest Common Factor

Learn

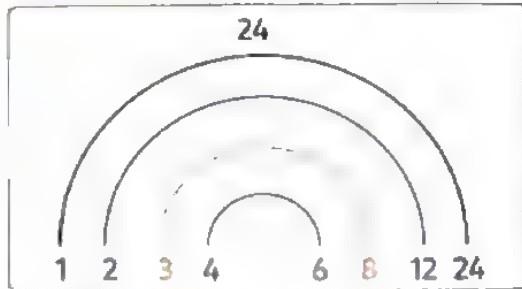
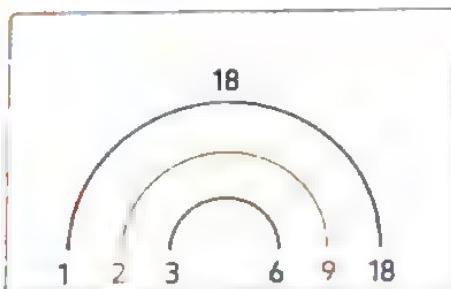
A scientist is setting up some study tanks. She has collected 18 identical fish and 24 identical plants. She wants all tanks to be alike and contain as many fish and plants as possible. What is the greatest number of tanks she can set up?



Think : How can you find the common factors for 18 and 24

The greatest number of tanks she can set up is the greatest common factor of 18 and 24.

- Common factors of two numbers are factors that are the same.
- The greatest common factor [GCF] of two numbers is the greatest number that is a factor of both.



- Factors of 18 : 1, 2, 3, 6, 9, 18
- Factors of 24 : 1, 2, 3, 4, 6, 8, 12, 24
- Common factors : 1, 2, 3, 6
- The greatest common factor [GCF] : 6

So, the greatest number of tanks is 6 tanks of 3 fish and 4 plants in each tank.

$$18 \div 6 = 3$$
$$24 \div 6 = 4$$

Notes for parents :

- Tell your child that common factors and greatest common factors are helpful to solve many problems in life.

Example

Find all the common factors and GCF of each pair.

a. 12 and 15

b. 16 and 28

c. 7 and 11

Solution 

a. 12: $\boxed{1}, 2, \cancel{3}, 4, 6, 12$

15: $\boxed{1}, \cancel{3}, 5, 15$

Common factors: 1, 3

GCF: 3

Factors of 12		Factors of 15	
1	12	1	15
2	6	3	5
3	4		

b. 16: $\boxed{1}, \boxed{2}, \boxed{4}, 8, 16$

28: $\boxed{1}, \boxed{2}, \boxed{4}, 7, 14, 28$

Common factors: 1, 2, 4

GCF: 4

Factors of 16		Factors of 28	
1	16	1	28
2	8	2	14
4	4	4	7

c. 7: $\boxed{1}, 7$

11: $\boxed{1}, 11$

Common factor: 1

GCF: 1

Note that :

- 1 is the common factor of all whole numbers.

- All prime numbers has one common factor that is 1. Such as 7 and 11.

**Check** your understanding

Find all the common factors and GCF of:

a. 9 and 12

b. 25 and 15

- Give your child two numbers and let him/her find the common factors and the GCF of them such as (5 and 17), (4 and 12).

6-3 Greatest Common Factor

REMEMBER

KNOW

TRY

PROBLEM SOLVING

From the school book

1. List the factors of each number. Highlight or circle the common factors of each pair of numbers.

- a. 16 and 20

Factors of 16: _____

Factors of 20: _____

- b. 18 and 4

Factors of 18: _____

Factors of 4: _____

- c. 20 and 30

Factors of 20: _____

Factors of 30: _____

- d. 17 and 22

Factors of 17: _____

Factors of 22: _____

- e. 21 and 35

Factors of 21: _____

Factors of 35: _____

- f. 36 and 42

Factors of 36: _____

Factors of 42: _____

2. List the common factors of the given numbers.

C

a. 4 and 12 —

b. 10 and 35 —

c. 17 and 34 —

d. 18 and 24 —

e. 25 and 30 —

f. 22 and 44 —

g. 66 and 33 —

h. 45 and 63 —

i. 19 and 23 —

3. Find the common factors and the greatest common factor (GCF) of :

C

a. 4 and 6

Factors of 4 : —

Factors of 6 : —

Common factors : —

GCF : —

b. 10 and 30

Factors of 10 : —

Factors of 30 : —

Common factors : —

GCF : —

c. 40 and 45

Factors of 40 : —

Factors of 45 : —

Common factors : —

GCF : —

d. 54 and 18

Factors of 54: _____

Factors of 18: _____

GCF: _____

Common factors: _____

e. 48 and 60

Factors of 48: _____

Factors of 60: _____

GCF: _____

Common factors: _____

4. Find the GCF of the given numbers.

o

a. 8 and 16

b. 12 and 18

c. 40 and 50

d. 10 and 45

e. 10 and 24

f. 45 and 81

g. 40 and 48

h. 33 and 11

5. Use what you know about factors and common factors to solve each problem.

- a. Sylvia has 21 pencils and 14 erasers. She wants to put them in groups. What is the greatest number of groups that can be made so that each group has the same number of items? How many pencils will be in each group? How many erasers will be in each group?
-
-
-
- b. There are 40 girls and 32 boys who want to participate in lap on teams. If each team must have the same number of girls and the same number of boys, what is the greatest number of teams that can participate? How many girls will be in each team? How many boys will be in each team?
-
-
-
- c. A class is going on a field trip. There are 36 girls and 27 boys in the class. Students will be divided into groups of girls and boys. What is the greatest number of groups that can be made so that each group has the same number of children? How many children will be in each group of boys? How many children will be in each group of girls?
-
-
-
- d. Mohab is making flower arrangements. He has 7 roses and 14 daisies. If Mohab wants to make all the arrangements identical and have no flowers left over, what is the greatest number of flower arrangements that he can make? How many roses and how many daisies will be in each flower arrangement?
-
-
-
- e. Eslam has 60 blue marbles and 24 red marbles. If he wants to place them in identical groups without any marbles left over, what is the greatest number of groups Eslam can make? How many blue marbles and how many red marbles will be in each group?
-
-
-

- f. Amira and her friends are going on a picnic. Amira wants to make snack packs of apples and candy to take on the picnic. She has 24 apples and 36 small bags of candy. What is the greatest number of snack packs Amira can make if each pack must have exactly the same number of apples and exactly the same number of bags of candy with no snacks left over? How many apples will be in each snack pack? How many bags of candy will be in each snack pack?

- g. For a dinner party, Adam is creating individual servings. He has 28 pieces of fruit and 14 yogurt cups. If he wants each serving to be identical with no food left over, what is the greatest number of servings Adam can create? How many pieces of fruit and how many yogurt cups will be in each serving?



Challenge

6. Find the GCF of 15, 18 and 21.



7. Find two numbers that have 6 as the greatest common factor.



8. The common factors of two numbers are 1 and 3.



The two numbers could be 9 and 21 or 3 and 6. Explain how.

Multiple Choice Questions

Choose the correct answer.

1. Which of the following are the common factors of 4 and 6?
- A. 1 and 2
 - B. 1 and 3
 - C. 2 and 3
 - D. 3 and 4
2. Which of the following are the common factors of 15 and 25?
- A. 1 and 3
 - B. 1 and 5
 - C. 1 and 15
 - D. 1 and 25
3. The GCF of 18 and 27 is
- A. 1
 - B. 3
 - C. 6
 - D. 9
4. The GCF of 20 and 30 is
- A. 1
 - B. 4
 - C. 5
 - D. 10
5. The common factor of all numbers is
- A. 0
 - B. 1
 - C. 2
 - D. 3
6. 1 and 7 are the common factors of
- A. 2 and 7
 - B. 2 and 14
 - C. 7 and 12
 - D. 7 and 14
7. Which two numbers are common factors of 48 and 54?
- A. 2
 - B. 6
 - C. 8
 - D. 9
 - E. 12
 - F. 24
8. Which two numbers are common factors of 27 and 63?
- A. 2
 - B. 3
 - C. 4
 - D. 7
 - E. 9
 - F. 11
9. Which pair of numbers has the same greatest common factor as 42 and 12?
- A. 9 and 6
 - B. 8 and 24
 - C. 16 and 60
 - D. 18 and 30
10. Which pair of numbers has the same greatest common factor as 84 and 96?
- A. 8 and 12
 - B. 24 and 36
 - C. 45 and 60
 - D. 6 and 54
11. Which phrase defines common factors between two numbers, such as 16 and 28?
- A. The factors of each number 16 and 28, listed with the greatest factor found on both lists circled.
 - B. The factors of each number 16 and 28, listed with the same factors found on both lists circled.
 - C. The factors of each number 16 and 28, listed with the smallest factor found on both lists circled.
 - D. The factors of each number 16 and 28, listed with the differing factors found on both lists circled.

Concept 1 Assessment | Unit 6



1. Choose the correct answer.

- a. Which of the following numbers is a prime number?
A. 1 B. 11 C. 14 D. 50
- b. The number _____ has all factors 1, 2, 4, 8 and 16
A. 8 B. 12 C. 16 D. 32
- c. The factors of 27 are _____.
A. 1, 3, 9 B. 1, 3, 27 C. 1, 3, 9, 27 D. 1, 3, 7, 9, 27
- d. The number 13 has _____ factors.
A. 1 B. 2 C. 3 D. 4
- e. The factor pair _____ is for the number 35.
A. 2 and 17 B. 5 and 4 C. 5 and 7 D. 4 and 7
- f. The GCF of 48 and 56 is _____.
A. 6 B. 8 C. 9 D. 12

2. Complete the following.

- a. _____ is the only even prime number.
- b. The common factors of 30 and 21 are _____ and the GCF is _____
- c. $48 = 1 \times \underline{\hspace{2cm}} = 2 \times \underline{\hspace{2cm}} = 3 \times \underline{\hspace{2cm}} = 4 \times \underline{\hspace{2cm}} = 6 \times \underline{\hspace{2cm}}$
The all factors are: _____
- d. The number 25 is a _____ number because it has _____ factors.
- e. The number 32 has _____ factor pairs.
- f. The composite numbers between 1 and 10 are _____

3. Write (✓) or (✗).

- a. The GCF of 36 and 12 is 6 []
- b. The number 47 is a prime number. []
- c. The all factors of 28 are 1, 2, 3, 4, 7, 14, 28 []
- d. The common factors of 12 and 16 are 1, 2, 4 []

e. The number 22 is a composite number.

[]

f. All odd numbers are prime numbers.

[]

4. Match each pair of numbers with their greatest common factor (GCF).

a. 60 and 45

1. 9

b. 20 and 40

2. 12

c. 81 and 45

3. 15

d. 84 and 36

4. 20

5. List all the factors of each number. You may create a factor tree, factor rainbow or factor T-chart.

a. 12

b. 25

c. 54

6. Is 9 a factor of 81? How do you know?

o

7. The number is an even number greater than 50 and less than 70. It has 10 as a factor.
o What is the number?

8. Find the common factors and the greatest common factor (GCF) of each pair of the following.

a. 10 and 14

b. 11 and 33

c. 25 and 36

9. Is 19 a prime number? How do you know?

o

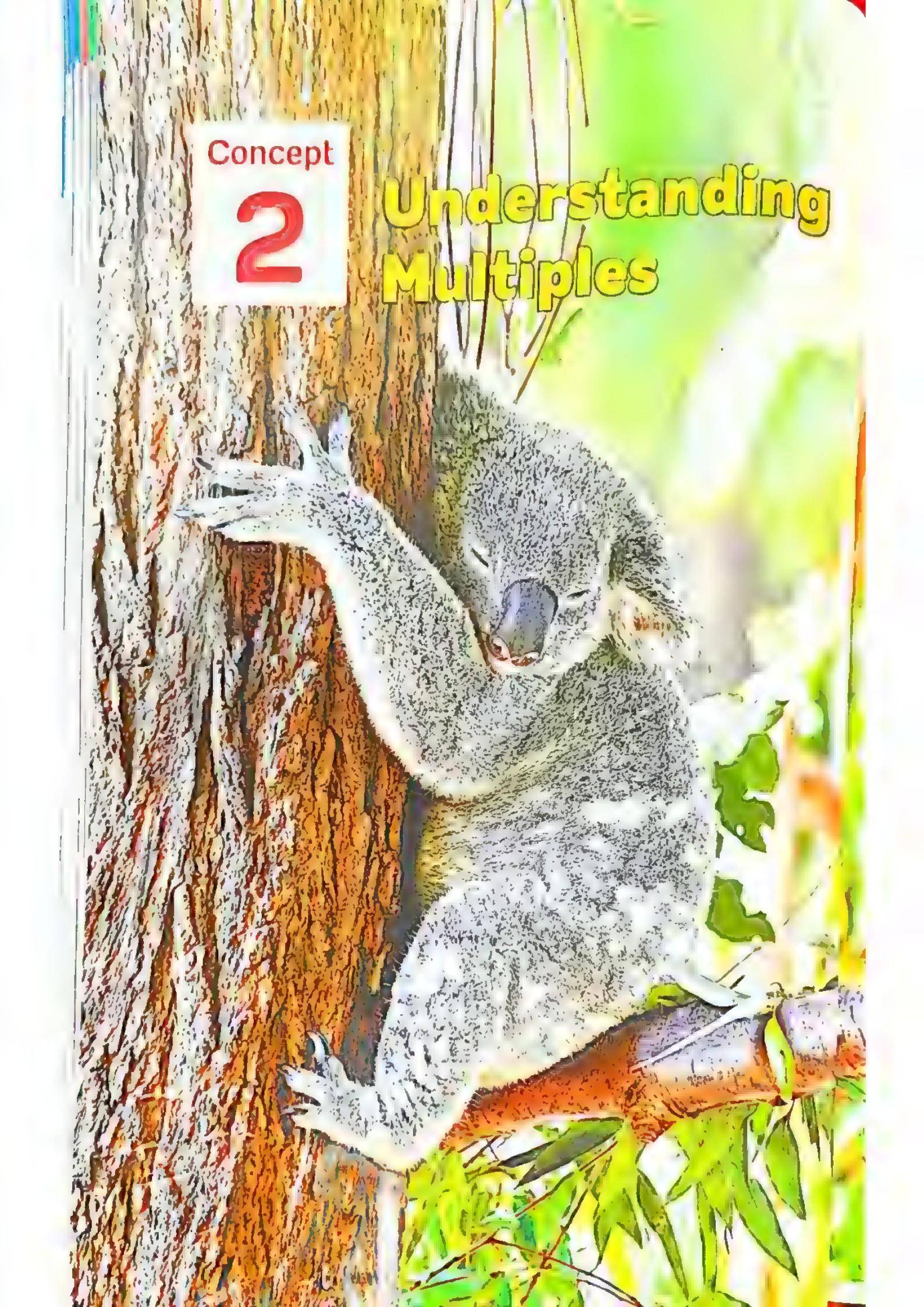
10. Are the numbers that have 4 as a factor also have 2 as a factor? How do you know?

o

11. What factor pair does every number have?

o

12. A farmer is making fruit arrangements. He has 48 oranges and 80 apples. If he wants to put them in identical groups without any fruit left over, what is the greatest number of groups he can make? How many oranges and how many apples will be in each group?

A detailed illustration of a koala clinging to a vertical tree trunk. The koala's grey fur is visible, along with its brown eyes and small ears. Its front paws are gripping the rough, brown bark. In the background, there are green leaves and branches, suggesting a lush forest environment.

Concept

2

Understanding Multiples

Concept Overview

In concept 2:

Understanding Multiples, students explore the concept of multiples. As with factors, they use their knowledge of multiplication facts and patterns in skip counting to identify multiples, common multiples, and least common multiples between two numbers. This work prepares them for working with larger numbers and fractions.

Fast Fact

*Believe it or not,
Koalas can sleep up
to 18 hours a day!
How many hours do
they sleep per week?*

Lesson No.	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 3	6-4 Identifying Multiples of Whole Numbers	Multiples-Skip count	<ul style="list-style-type: none">Students will define multiples of whole numbers.Students will identify multiples of whole numbers.
	6-5 Common Multiples	Review vocabulary as needed.	<ul style="list-style-type: none">Students will identify common multiples between two numbers.
Lesson 4	6-6 Relationships between Factors and Multiples	Common multiple-Factor-Multiples-Product.	<ul style="list-style-type: none">Students will explain the relationship between factors and multiples.Students will determine if a number is a factor or a multiple of another number.

6-4 Identifying Multiples of Whole Numbers

6-5 Common Multiples

Learn

Sandy has a piano lesson every seventh day during March. Her first lesson is on March 7. On what other dates in March will she have a piano lesson? The dates of Sandy's lessons are multiples of 7. So, Sandy will have piano lessons on March 14, 21 and 28.

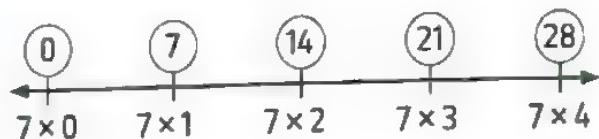
March						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

What is a multiple?

A **multiple** is the product of a given number and another whole number.

To find multiples of any number, multiply by the whole numbers 0, 1, 2, 3, 4, and so on.

The first five multiples of 7 are shown below. A multiple of 7 is any product that has 7 as a factor.



Notes for parents :

- Explain that the number of multiples that a number has is endless.

- You can also make a list or skip-count on a number line to find multiples.

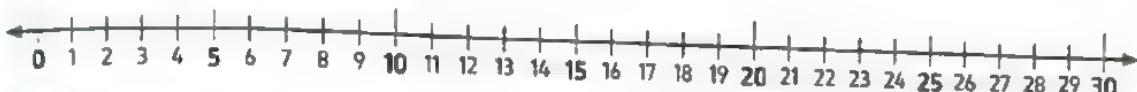
Example 1

Make a list	Use a Number Line	Remark
First 7 multiples of 10: 0, 10, 20, 30, 40, 50, 60		Zero is a multiple for any number
First 7 multiples of 3: 0, 3, 6, 9, 12, 15, 18		

Check your understanding

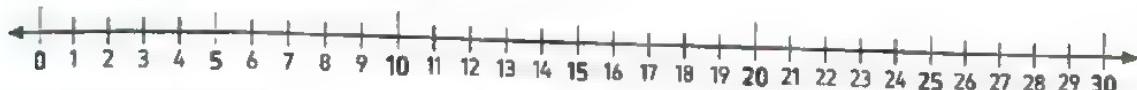
Skip counting on a number line, start at 0 and write the first 5 multiples of each number

- Skip count by 2s on the number line.



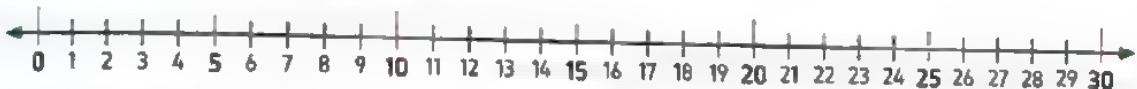
First 5 multiples of 2: _____, _____, _____, _____, _____

- Skip count by 4s on the number line.



First 5 multiples of 4: _____, _____, _____, _____, _____

- Skip count by 5s on the number line.



First 5 multiples of 5: _____, _____, _____, _____, _____

- You can use 100 chart to find the multiples (except zero)

For example

To find the multiples of 2 skip count by 2s, then the multiples of 2:

2, 4, 6, 8, 10, 12, ...

Start →

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

- Skip counting on the number chart helps your child notice the patterns to help him/her find the multiples more quickly

Example 2

Find the multiples of 5

Solution

$5 \times$ any number = its multiple

Then $5 \times 0 = 0$, $5 \times 1 = 5$, $5 \times 2 = 10$, $5 \times 3 = 15$, ...

So 0, 5, 10, 15, ... are multiples of 5



Check

your understanding

- a. List 4 multiples of 8

- b. Circle the numbers that are multiples of 3.

12, 17, 6, 22, 18, 27

Learn

Common Multiples

A **common multiple** is a multiple of two or more numbers.

Finding common multiples using number chart

Look at the column that starts with 2.

All the numbers in this column are multiples of 2.

- List the multiples of 2 on the table.

0, 2, 4, 6, 8, 10, 12, 14, 16, 18, ...

Look at the column that starts with 3.

All the numbers in this column are multiples of 3.

- List the multiples of 3 on the table.

0, 3, 6, 9, 12, 15, 18, 21, 24, ...

These numbers that are on both lists are common multiples of 2 and 3.

- List the common multiples of 2 and 3.

0, 6, 12, 18, ...

x	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

Notes for parents :

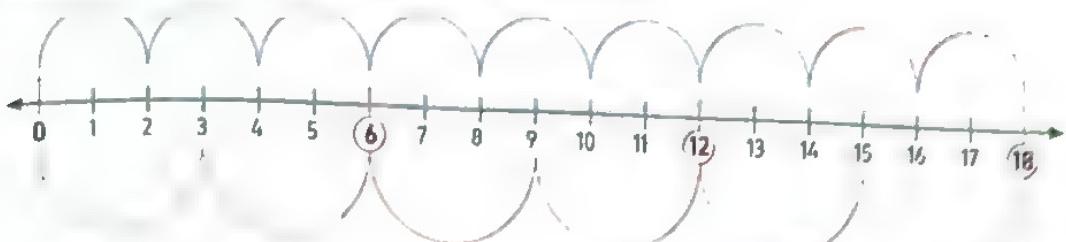
- Ask your child use a number chart to find multiples of a number, ask him/her to use it to find the common multiples of two numbers.

Finding common multiples using number line

- You can use a number line to find common multiples.

Example:

Use a number line to find common multiples of 2 and 3



The common multiples of 2 and 3 are
0, 6, 12, 18, ... and so on.

Remark

Zero is a common multiple for any numbers.

Example 3

Find the multiples of each of the numbers 4 and 6 up to 50, then find the common multiples between them.

Solution

- The multiples of 4 are: 0, 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48
- The multiples of 6 are: 0, 6, 12, 18, 24, 30, 36, 42, 48
- The common multiples of 4 and 6 are: 0, 12, 24, 36, 48



Check your understanding

Find the multiples of each of 7 and 3 up to 50, then find the common multiples between them.

Solution

The multiples of 7 are _____

The multiples of 3 are _____

The common multiples are _____

- Listing multiples help your child find common multiples.

Exercise

32

6-4 Identifying Multiples of Whole Numbers

6-5 Common Multiples

REMEMBER

UNDERSTAND

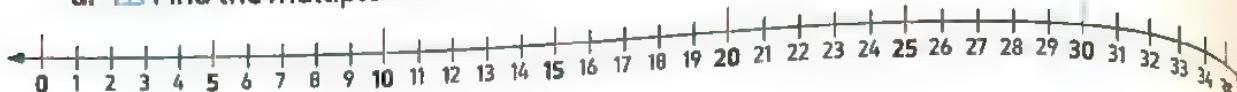
AUDIO

PROBLEM SOLVING

From the school book

- 1.** Skip counting on a number line. Draw a line connecting each number to show skip counting on the number line. Start at 0 each time.

- a. Find the multiples of 2



The multiples of 2 are _____

- b. Find the multiples of 5



The multiples of 5 are _____

- c. Find the multiples of 7



The multiples of 7 are _____

- d. Find the multiples of 8



The multiples of 8 are _____

- 2.** Color the multiples. Use the hundreds chart.

- a. Color the multiples of 2

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

The multiples of 2 are: _____

- b. Color the multiples of 5

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

The multiples of 5 are: _____

c. Color the multiples of 9

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

The multiples of 9 are: _____

d. Color the multiples of 10

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

The multiples of 10 are: _____

3. a. Circle the numbers that are multiples of 6

7 , 16 , 12 , 6 , 21 , 24 , 18

b. Circle the numbers that are multiples of 3

6 , 17 , 21 , 15 , 10 , 36 , 29

c. Circle the numbers that are multiples of 8

6 , 8 , 10 , 16 , 18 , 24 , 30 , 32 , 36

d. Circle the numbers that are multiples of 9

9 , 12 , 18 , 21 , 28 , 27 , 30 , 36 , 40 , 44 , 54

e. Which of the following is NOT a multiple of 4 ?

4 , 30 , 20 , 44 , 36

f. Which of the following is NOT a multiple of 5 ?

5 , 31 , 35 , 40 , 15 , 10 , 16

g. Which of the following is NOT a multiple of 2 ?

6 , 12 , 14 , 7 , 29 , 18 , 17

4. a. List 5 multiples of 7.

b. List 5 multiples of 8.

c. List the multiples of 3 up to 20.

d. List the multiples of 5 up to 30.

e. List the multiples of 9 up to 60.

5. a. Is 34 a multiple of 9?

c. Is 35 a multiple of 4?

e. Is 7 a multiple of 7?

b. Is 40 a multiple of 8?

d. Is 30 a multiple of 2?

f. Is 81 a multiple of 9?

6. Find the missing multiple.

a. 5 , 10 , 15 ,

b. 8 , 16 , 24 ,

c. 10 , 20 , , 40

d. 70 , 80 , , 100

e. 12 , 15 , , 21

f. 22 , , 44 , 55

g. 36 , , 54 , 63

h. , 14 , 21 , 28

i. , 24 , 30 , 36

7. a. Find the multiples of each of the numbers 2 and 3 up to 20, then find the common multiples between them.

The multiples of 2 are:

The multiples of 3 are:

The common multiples are:

b. Find the multiples of each of the numbers 5 and 4 up to 30, then find the common multiples between them.

The multiples of 5 are:

The multiples of 4 are:

The common multiples are:

c. Find the multiples of each of the numbers 6 and 8 up to 50, then find the common multiples between them.

The multiples of 6 are:

The multiples of 8 are:

The common multiples are:

8. a. ... Find a common multiple of 4 and 8.

b. ... Find a common multiple of 7 and 3.

c. Find a common multiple of 5 and 4.

d. ... Find two common multiples of 2 and 6.

e. ... Find two common multiples of 4 and 6.

f. Find two common multiples of 3 and 9.

9. David has soccer practice every sixth day during June, beginning June 6.

What are the dates of his other practices in June?

10. Nagwa plans to visit her grandparents every fourth day in May. Her first visit will be May 4.

How many times will she visit during May?

11. **Writing About Math** Tahani takes the bus home from school every day, but it does

not take her directly to her house. After the bus drops Tahani off, she must walk the rest of the way home. The bus she takes stops every 4 kilometers as it leaves the school. If Tahani lives 18 km from school, how far does she have to walk home from the bus stop?

Draw a picture to represent your thinking.

Challenge

12. a. Find two common multiples of 2, 3 and 5

b. Find two common multiples of 6, 4 and 10

Multiple Choice Questions

Choose the correct answer.

- | | |
|--|---|
| <p>1. Is a multiple of 3.</p> <ul style="list-style-type: none"> <input type="radio"/> A. 4 <input checked="" type="radio"/> B. 12 <input type="radio"/> C. 14 <input type="radio"/> D. 20 | <p>2. Which of the following is a multiple of 7?</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> A. 3 <input type="radio"/> B. 45 <input type="radio"/> C. 56 <input type="radio"/> D. 89 |
| <p>3. 20 is a multiple of</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> A. 3 <input type="radio"/> B. 6 <input type="radio"/> C. 8 <input type="radio"/> D. 10 | <p>4. Which is a common multiple of 5 and 10?</p> <ul style="list-style-type: none"> <input type="radio"/> A. 20 <input checked="" type="radio"/> B. 40 <input type="radio"/> C. 35 <input type="radio"/> D. 45 |
| <p>5. Which is a common multiple of 10 and 20?</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> A. 10 <input type="radio"/> B. 15 <input type="radio"/> C. 20 <input type="radio"/> D. 25 | <p>6. Which is NOT a common multiple of 5 and 6?</p> <ul style="list-style-type: none"> <input type="radio"/> A. 18 <input checked="" type="radio"/> B. 27 <input type="radio"/> C. 36 <input type="radio"/> D. 42 |
| <p>7. Which is NOT a multiple of 6?</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> A. 0 <input type="radio"/> B. 30 <input type="radio"/> C. 20 <input type="radio"/> D. 42 | <p>8. The common multiple for all numbers is _____.</p> <ul style="list-style-type: none"> <input type="radio"/> A. 0 <input checked="" type="radio"/> B. 1 <input type="radio"/> C. 2 <input type="radio"/> D. 4 |
| <p>9. The common multiples of 6 and 8 are the same as the multiples of which number?</p> <ul style="list-style-type: none"> <input type="radio"/> A. 8 <input checked="" type="radio"/> B. 12 <input type="radio"/> C. 20 <input type="radio"/> D. 48 | <p>10. Which list shows common multiples of 6 and 8?</p> <ul style="list-style-type: none"> <input type="radio"/> A. 6, 8, 24 <input checked="" type="radio"/> B. 60, 80, 100 <input type="radio"/> C. 24, 48, 72 <input type="radio"/> D. 36, 64, 80 |
| <p>11. To identify multiples of 9, Ahmed used the following equations:</p> <p style="text-align: center;">Equation 1: $9 \times 2 = 18$</p> <p style="text-align: center;">Equation 2: $18 + 9 = 27$</p> <p>Which statement is true?</p> <ul style="list-style-type: none"> A. Only 18 is a multiple of 9 because it was found by multiplying by 9. B. Only 27 is a multiple of 9 because it was found by adding 9. C. Both 18 and 27 are multiples of 9 because they were found by multiplying whole numbers by 9. D. Both 18 and 27 are multiples of 9 because they were found by multiplying by 9 or adding 9 on to another multiple. | |

6-6 Relationships between Factors and Multiples

Learn

You can use a multiplication table to find the relation between factors and multiples.

Step 1

Find 18 on the multiplication table.

- Look at the number at the top of the column. 6 is a factor of 18
- Look at the number at the side of the row. 3 is a factor of 18.



A boy in a striped shirt is pointing to a multiplication table on a wall. The table shows products of numbers from 1 to 12. The columns are labeled with numbers 1 through 12, and the rows are labeled with numbers 1 through 12. The number 18 is circled in the 6th column and 3rd row intersection. Arrows point from the word 'column' to the 6th column and from the word 'row' to the 3rd row.

*	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

then, 18 is a multiple of each of 6 and 3

Step 2

Find 18 in other places on the table. List other factors of 18.

18 is a multiple of _____, _____

Step 3

Repeat steps 1 and 2 to find factors of 24

- What factors did you find?
- Do you think these are all of the factors of 24? Explain.



Notes for parents :

- Help your child use a multiplication table to recognize the relation between factors and multiples.

Example

Making connection. Think about the relationships between the numbers in each group.
Write at least two sentences describing what you notice.

a. 2, 4 and 16

b. 3, 2, 6 and 18

Solution 

a. • $2 \times 2 = 4$, $2 \times 8 = 16$, then all numbers are multiples of 2

- 2 and 4 are factors of 16

- 16 is a multiple of 4 [Answers may vary]

b. • 3 and 2 are factors of 6

- 18 is a multiple of 6

- 6 is a multiple of 3 [Answers may vary]

 **Check** your understanding

a. Write 3 factors of 12. _____, _____, _____

b. Write 3 multiples of 4. _____, _____, _____

c. Is 16 a multiple of 8? _____

d. Is 6 a multiple of 12? _____

Notes for parents :

- Ask your child to explain the difference between a factor and a multiple.

**Exercise
33**

6-6 Relationships between Factors and Multiples

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

1. Complete the following.

- a. Write 3 multiples of 5 _____, _____, _____
- b. Write 3 multiples of 6 _____, _____, _____
- c. Write 3 factors of 30 _____, _____, _____
- d. Write 4 factors of 20 _____, _____, _____, _____
- e. If $4 \times 9 = 36$, then _____ is a multiple of the two numbers _____ and _____.
Also, _____ and _____ are factors of the number _____
- f. If $7 \times 3 =$ _____, then _____ is a multiple of the two numbers _____ and _____

2. Write (✓) to the correct answer and (✗) to the incorrect answer.

- a. 6 is a factor of 2.
- b. 8 is a multiple of 4.
- c. 12 is a multiple of 3 and 6.
- d. 5 is a factor of 30.
- e. 45 is an even number that is a multiple of 5 and 9.
- f. 27 is an odd number that is a multiple of 3 and 8.

3. Multiples Riddles. Read each riddle and solve. There may be more than one answer.

- a. The number is an odd number. It is a multiple of 3 and 5. It is greater than 20.

What number is it?

- b. The number is an even number. It is a multiple of 4 and 3 and lies between 20 and 40.
What number is it?
- c. The number is an even number. It is a multiple of 4 and 8. It is between 10 and 20.
What number is it?
- d. The number is an even number. It is a multiple of 3, 4 and 6. What number is it?
- e. The number is an even number. It is a multiple of 3, 2 and 7. What number is it?

4. Answer the following questions.



a. Is 2 a factor of 12? _____

b. Is 6 a factor of 24? _____

c. Is 14 a multiple of 7? _____

d. Is 10 a multiple of 2? _____

e. Is 24 a factor of 8? _____

f. Is 2 a multiple of 4? _____

g. Is 0 a multiple of 9? _____

h. Is 16 a multiple of 3? _____

i. Is 5 a factor of 25 or a multiple of 25? _____

j. Is 32 a factor of 8 or a multiple of 8? _____

k. Is 1 a factor of 9 or a multiple of 9? _____

l. What multiple of 7 is a factor of 7? _____

5. Making connections. Think about the relationships between the numbers in each group.
Write at least two sentences describing what you notice.

a. 3, 6 and 12

b. 4, 8, 16 and 24

c. 2, 4, 3, 12

d. 5, 3, 12, 30

6. How are factors and multiples related?

o

Challenge

7. There is a number between 10 and 20 and it is a multiple of the number 4 and a factor of the number 24.

What is this number?

Concept

1

Multiplying by 1-Digit and 2-Digit Factors



Concept Overview

In concept 1:

When multiplying by One-Digit and Two-Digit Factors, students build on their learning in Primary 3 to deepen and extend their understanding of multiplication and improve their procedural fluency. They explore three different strategies for multiplying - the area model strategy, the partial products algorithm, and the standard algorithm. They apply their knowledge of place value, patterns when multiplying by multiples of 10, and multiplication facts to solve multiplication problems. Good mathematicians make connections between mathematical concepts and use those connections to solve problems. This concept encourages that practice.

Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 1 7-1 The Area Model Strategy	Area model - Decompose	<ul style="list-style-type: none"> Students will use area models to represent two-digit by one-digit multiplication. Students will explain how they use place value to multiply.
	Area model - Decompose - Distributive property of multiplication	<ul style="list-style-type: none"> Students will use an area model to multiply a one-digit number by a whole number with up to four digits. Students will explain the distributive property of multiplication. Students will apply the distributive property of multiplication to multiply a one-digit number by a whole number with up to four digits.
Lesson 2 7-3 The Partial Products Algorithm 7-4 The Standard Multiplication Algorithm 7-5 Review Connecting Strategies	Area model - Distributive property of multiplication - Algorithm - Partial products algorithm	<ul style="list-style-type: none"> Students will use the partial products algorithm to multiply a one-digit number by a whole number with up to four digits.
	Standard algorithm - Distributive property of multiplication - Area model - Partial products	<ul style="list-style-type: none"> Students will estimate products of multi digit multiplication problems. Students will use the standard algorithm to multiply a one-digit number by a whole number with up to four digits.
	Review vocabulary as needed	<ul style="list-style-type: none"> Students will use the standard algorithm to multiply a one-digit number by a whole number with up to four digits.
Lesson 3 7-6 Two-Digit Multiplication 7-7 Area Models and Two-Digit Multiplication	Distributive property of multiplication	<ul style="list-style-type: none"> Students will identify patterns when multiplying two multiples of 10. Students will multiply a two-digit number by a multiple of 10. Students will assess the reasonableness of an answer using estimation and mental math.
	Review vocabulary as needed	<ul style="list-style-type: none"> Students will be able to use the area model to solve two-digit by two-digit multiplication problems.
Lesson 4 7-8 Algorithms and Two-Digit Multiplication 7-9 Putting It All Together	Review vocabulary as needed	<ul style="list-style-type: none"> Students will apply a variety of strategies to solve two-digit by two-digit multiplication problems.
	Review vocabulary as needed	<ul style="list-style-type: none"> Students will apply the three reads strategy to analyze and solve story problems. Students will add, subtract, or multiply to solve story problems.

Multiple Choice Questions

Choose the correct answer.

1. _____ is a factor of 6.

- A. 2
- B. 12
- C. 18
- D. 24

2. _____ is a multiple of 12.

- A. 3
- B. 4
- C. 6
- D. 12

3. _____ is a multiple of 8.

- A. 2
- B. 4
- C. 10
- D. 16

4. _____ is an even number that is

- a multiple of 2, 4, 5.
- A. 10
- B. 8
- C. 15
- D. 20

5. _____ is an odd number that is

- a multiple of 3 and 7.
- A. 7
- B. 14
- C. 21
- D. 42

6. Multiples of 2 are _____ numbers.

- A. even
- B. odd
- C. prime

7. Which of the following is true?

- A. 5 is a multiple of 10
- B. 10 is a factor of 5
- C. 5 is a factor of 10
- D. 6 is a multiple of 4

8. Which of the following is false?

- A. 282 is a multiple of 2
- B. 0 is a multiple of 7
- C. 3 is a factor of 24
- D. 8 is a factor of 14

9. Tell whether the first number is a multiple of the second.

- A. 4, 8
- B. 2, 20
- C. 18, 9
- D. 14, 7

10. Which statement is true about multiples of whole numbers?

- A. The number 4 is a multiple of 12 because the numbers 3 and 4 are a factor pair for 12.
- B. The number 18 is a multiple of 2 because the numbers 2 and 9 are a factor pair for 18.
- C. The number 6 is a multiple of 6 because the numbers 0 and 6 are a factor pair for 6.
- D. The number 15 is a multiple of 5 because the numbers 5 and 10 are a factor pair for 15.

11. Which *two* statements explain the relationship between factors and multiples?

- A. Thirty-six is a multiple of 3, 6 and 9, therefore 3, 6 and 9 are factors of 36.
- B. Thirty-six is a factor of 3, 6 and 9, therefore 3, 6 and 9 are multiples of 36.
- C. 3, 6 and 9 are factors of 36, therefore 3, 6 and 9 are multiples of 36.
- D. Twenty-seven is a multiple of 3 and 9, therefore 3 and 9 are factors of 27.
- E. Twenty-seven is a factor of 3 and 9, therefore 3 and 9 are multiples of 27.
- F. 3 and 9 are factors of 27, therefore 3 and 9 are multiples of 27.

Concept 2 Assessment | Unit 6



1. Write (✓) to the correct answer and (✗) to the incorrect answer.

- a. 2 is a factor of 12. ()
- b. 8 is a multiple of 4. ()
- c. 20 is a common multiple of 2 and 5. ()
- d. The common multiple for all numbers is 1. ()
- e. $3 \times 8 = 24$, then 8 is a multiple of 24. ()
- f. 45 is a common multiple for 5 and 3. ()

2. Choose the correct answer.

- a. _____ is a multiple of 6.
 - A. 1
 - B. 3
 - C. 2
 - D. 6
- b. _____ is a common multiple of 4 and 6.
 - A. 2
 - B. 3
 - C. 8
 - D. 12
- c. Which is not a common multiple of 2 and 3?
 - A. 24
 - B. 20
 - C. 12
 - D. 6
- d. _____ is an even number that is a multiple of 2, 3 and 4 and lies between 20 and 30.
 - A. 12
 - B. 16
 - C. 24
 - D. 28
- e. Which list of numbers are all common multiples of 3 and 7?
 - A. 1, 3, 7
 - B. 21, 42, 63
 - C. 21, 28, 35
 - D. 15, 21, 27
- f. Is 27 a multiple of 9?
 - A. yes, because 3 and 9 are factors of 27.
 - B. no, because 1 and 9 are factors of 9.
 - C. no, because 9 and 243 are multiples of 27.
 - D. yes, because 9 and 3 are multiples of 27.

3. Complete.

- a. If $35 = 5 \times 7$, then _____ is a multiple of the two numbers _____ and _____.
- b. _____ is a common multiple of 4 and 5 and lies between 10 and 30.
- c. 4 is a multiple of _____.
- d. _____ is a multiple of all numbers.

e. Skip count by 8

8. _____, 24, _____, _____, 48, _____

f. 8 is a factor of _____ [Write two numbers].

4. Match.

a. Is a multiple of 3

1. 5

b. Is a factor of 10

2. 6

c. Is a factor of 32

3. 8

d. Is a multiple of 7

4. 28

5. Find the multiples of each of the numbers 6 and 9 up to 60, then find the common multiples between them.

6. Think about the relationships between the numbers 3, 8, 4, and 24. Write at least two sentences describing what you notice.

7. Write 3 factors of 40.

8. Write 3 multiples of 12.

9. What's the error? Nermine writes 6, 12, 18, 24, 30 as factors of 6. Describe her error.

Write the correct answer.

10. The number is an odd number. It is a multiple of 7 and 3 greater than 20. What numbers is it?

11. The number is an even number. It is a multiple of 3 and 5. It is between 10 and 40. What number is it?

12. • A bus traveling South arrives at a certain bus station every 3 minutes.

• A bus traveling North arrives at the same bus station every 4 minutes.

At 8:10 am., a bus traveling North and a bus traveling South arrive at the station.

This will happen again in _____ minutes, _____ minutes and in _____ minutes because they are all common _____ of 3 and 4. [Complete].

Unit Six Assessment



1. Write (✓) to the correct answer and (✗) to the incorrect answer.

- a. 4 is a multiple of 12. [] b. The number 7 has 2 factors. []
c. The GCF of 12 and 18 is 6. [] d. 13 is a composite number. []
e. 48 is a common multiple for 8 and 7. []
f. The all factors of 30 are 1, 2, 3, 5, 6, 10. []

2. Choose the correct answer.

a. Which number is a multiple of 9?

- A. 1 B. 3 C. 27 D. 30

b. The number _____ has the factors 1, 2, 4, 5, 10, 20.

- A. 10 B. 16 C. 20 D. 30

c. Which is NOT a common multiple of 3 and 5?

- A. 15 B. 30 C. 40 D. 45

d. _____ is NOT a prime number.

- A. 1 B. 2 C. 7 D. 11

e. _____ is a factor for all numbers.

- A. 0 B. 1 C. 2 D. 3

f. The number 36 has _____ factors.

- A. 3 B. 5 C. 8 D. 9

3. Complete.

a. The smallest prime number is _____

b. The composite numbers between 10 and 20 are _____

c. The GCF of 4 and 8 is _____

d. The prime number has two different factors are _____ and _____

e. The factors of 9 are _____

f. The odd number which is a multiple of 3, 7 and lies between 30 and 50 is _____

4. Match.

a. A factor of 20

b. A GCF for 24 and 30

c. A multiple of 8

d. A prime number

1. 32

2. 10

3. 19

4. 6

5. Find all factors of 30 and create a factor tree, a factor rainbow and T-chart.**6. Find the multiples of each of the numbers 8 and 12 up to 40, then find the common multiples between them.****7. Find the common factors and the greatest common factor (GCF) of 24 and 40.****8. Think about the relationship between the numbers 2, 3, 4, 12
[Write at least two sentences]****9. In each of the following numbers underline the prime numbers and circle the composite numbers.**

7 – 8 – 10 – 13 – 21 – 1 – 14

2 – 18 – 15 – 17 – 3 – 4 – 20

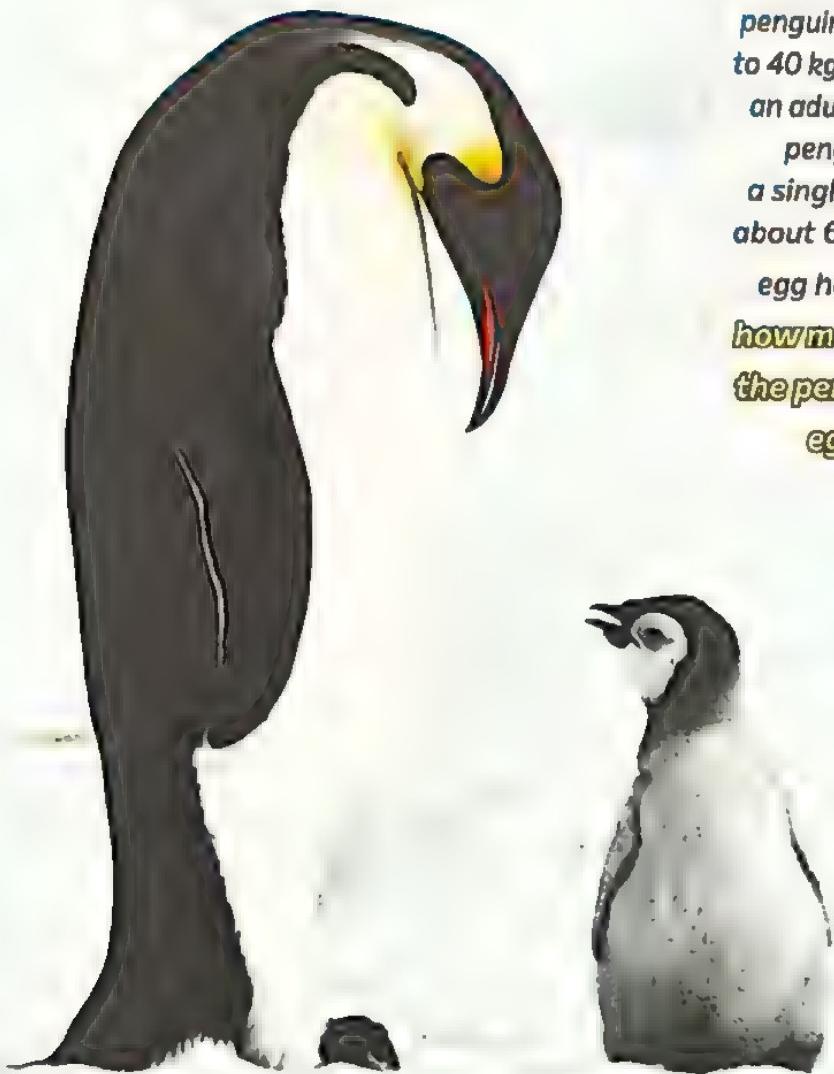
**10. The number is an even number greater than 20. It has 8 as a factor and is less than 30.
What number is it?****11. List 5 multiples of 6.****12. Is one a prime number? Why?**

Multiplication and Division: Computation and Relationships

- » **Concept 1:** Multiplying by 1-Digit and 2-Digit Factors
- » **Concept 2:** Dividing by 1-Digit Divisors



The emperor penguin is the world's largest penguin. It can weigh up to 40 kg. In the Antarctic, an adult male emperor penguin will keep a single egg warm for about 63 days until the egg hatches. About how many weeks will the penguin keep the egg warm?



Lesson

1

7-1 The Area Model Strategy

7-2 The Distributive Property

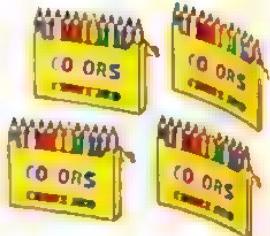
Learn

Model 2-digit multiplication

Mazen has 4 boxes of crayons.

Each box holds 12 crayons.

How many crayons does Mazen have in all?



Multiply: 4×12

Step 1

Model the problem using base-ten blocks.



$$\begin{array}{l} 4 \text{ tens} \\ [4 \times 1 \text{ ten} \\ = 4 \text{ tens}] \end{array}$$



$$\begin{array}{l} 8 \text{ ones} \\ [4 \times 2 \text{ ones} \\ = 8 \text{ ones}] \end{array}$$

Step 2

Record your work in a chart like this one.

Tens	Ones
4	8

So, Mazen has 48 crayons in all.

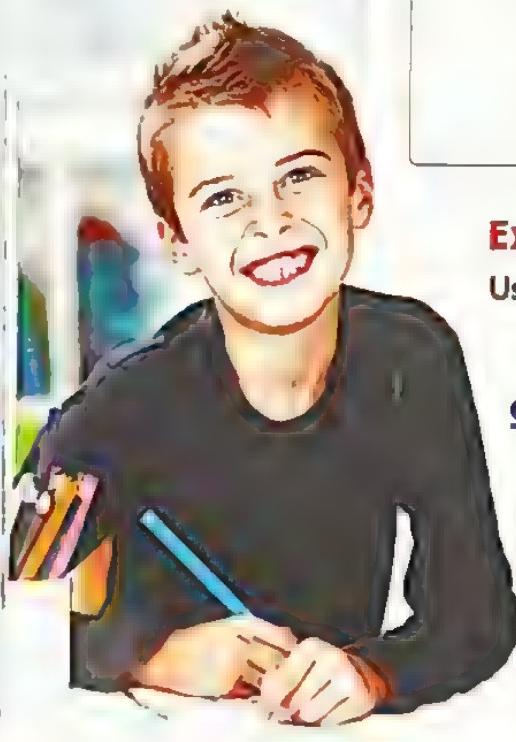
Example 1

Use base-ten blocks to find each product.

a. 22×4

b. 5×13

Solution



a. Model 4 groups of 22.

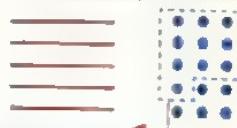


Tens	Ones
8	8

So, $22 \times 4 = 88$

b. Model 5 groups of 13.

Regroup 10 ones as 1 ten



Tens	Ones
6	5

So, $5 \times 13 = 65$

Notes for parents :

- Remind your child that when the number of ones blocks is 10 or greater, he/she needs to regroup 10 ones as 1 ten.

Learn**Multiplying with the area model**

The fourth and fifth grades plan to visit the Egyptian Museum. Each bus has room for 23 passengers.

The teachers have reserved 7 buses.

How many teachers and students can go on the trip?



Multiply: 7×23

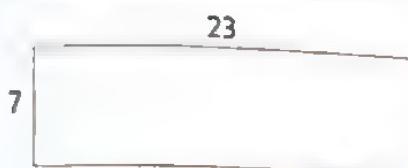
Model the problem using the rectangle area model.



Remember
Area of a rectangle = length × width

Step 1

Draw a rectangle where the smaller side shows 7 and the longer side shows 23.

**Step 2**

Decompose 23 using place value.

$$23 = 20 + 3$$

**Step 3**

Find the area of each of the new two rectangles, then add them.

$$\bullet 7 \times 20 = 140$$

$$\bullet 7 \times 3 = 21$$

$$140 + 21 = 161$$

$$\text{So, } 7 \times 23 = 161$$

So, 161 passengers can go on the trip

**Example 2**

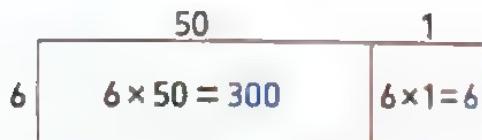
Draw an area model to solve each product.

a. 6×51

b. 39×8

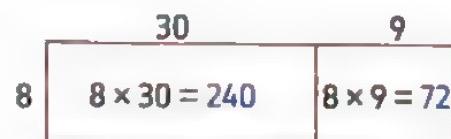
Solution

a. $51 = 50 + 1$



$$\text{So, } 6 \times 51 = 300 + 6 = 306$$

b. $39 = 30 + 9$



$$\text{So, } 39 \times 8 = 240 + 72 = 312$$

- While there are multiple ways to decompose a number, numbers should be decomposed using place value when using an area model for multiplication. For example, it is possible to decompose 23 in many different ways, including 17 and 6, 10 and 13, or 14 and 9. However, 23 should be decomposed into 20 and 3 when using an area model for multiplication.

Learn The distributive property and area models

Youssef is planting a flower garden. He wants to plant 8 rows with 24 sunflowers in each row.

How many sunflowers will he have in this garden?

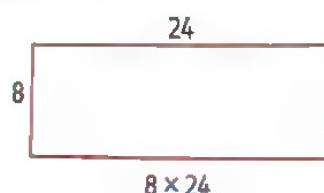
You can use the distributive property to solve this problem.

The distributive property states that multiplying a sum by a number is the same as multiplying each addend by the number and then adding the products.



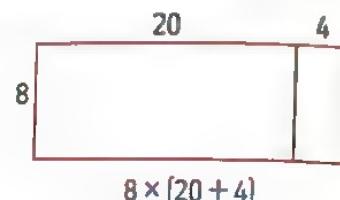
Step 1

Draw a rectangle that is 8 units wide and 24 units long.



Step 2

Break apart the rectangle into two rectangles because 24 has two digits. $24 = 20 + 4$

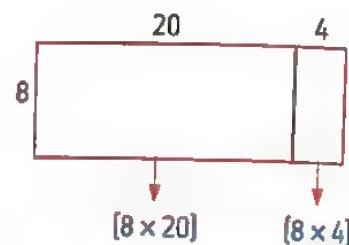


Step 3

Find the area of each of the new two rectangles.

$$\begin{aligned} 8 \times (20 + 4) &= [8 \times 20] + [8 \times 4] \text{ "Distributive property"} \\ &= 160 + 32 = 192 \end{aligned}$$

So, he will have 192 sunflowers.



Example 3

Use the distributive property to solve each problem.

a. 6×324

b. $7 \times 2,915$

c. 5×407

Solution

a. 6×324

$$\begin{aligned} &= 6 \times [300 + 20 + 4] \\ &= [6 \times 300] + [6 \times 20] + [6 \times 4] \\ &= 1,800 + 120 + 24 = 1,944 \end{aligned}$$



Notes for parents :

- Your child may incorrectly decompose the factors according to their digits rather than according to the value of their digits. He/She may decompose 24 as 2 and 4 rather than 20 and 4.

c. 7×295

$$= 7 \times [2,000 + 900 + 10 + 5]$$

$$= [7 \times 2,000] + [7 \times 900] + [7 \times 10] + [7 \times 5]$$

$$= 14,000 + 6,300 + 70 + 35 = 20,405$$

1,000	900	10	5
$7 \times 2,000$	7×900	7×10	7×5
= 14,000	= 6,300	= 70	= 35

c. 5×407

$$= 5 \times [400 + 7]$$

$$= [5 \times 400] + [5 \times 7]$$

$$= 2,000 + 35 = 2,035$$

400	$5 \times 400 = 2,000$	$5 \times 7 = 35$

Example 4

Laila read 5 books of 224 pages each.

Calculate how many pages she read.

**Solution**

$$\text{What Laila read} = 5 \times 224$$

$$= 5 \times [200 + 20 + 4]$$

$$= [5 \times 200] + [5 \times 20] + [5 \times 4]$$

$$= 1,000 + 100 + 20 = 1,120 \text{ pages}$$

200	20	
$5 \times 200 = 1,000$	$5 \times 20 = 100$	$5 \times 4 = 20$

**Check** your understanding

Use numbers and symbols to solve each problem.

Draw an area model to help you if necessary.

a. 7×29

b. 4×283

- Your child may get confused with how many zeros to place at the end of a product. For example, your child might write $7 \times 2,000 = 1400$ instead of $7 \times 2,000 = 14,000$. Your child may also write $5 \times 200 = 100$ instead of $5 \times 200 = 1,000$.

**Exercise
34**

7-1 The Area Model Strategy

7-2 The Distributive Property

REMEMBER

KNOWLEDGE

APPLY

PROBLEM SOLVING

From the school book

1. Use a quick draw to solve each of the problems that follow.

a. 17×4

b. 21×3

c. 14×5

- d. Twenty-two passengers can fit on each river bus at a time. What is the maximum number of passengers the river bus can carry if it makes 5 trips?

2. Draw an area model to solve each of the problems that follow.

a. 5×56

b. 8×23

c. 3×66

d. 9×43

e. 91×4

f. 75×2

g. 88×6

h. 67×4

i. $\square 91 \times 6$

j. $\square 35 \times 7$

k. $\square 78 \times 4$

l. $\square 32 \times 7$

m. 3×255

n. $\square 7 \times 206$

o. $\square 4 \times 594$

p. $\square 5 \times 483$

q. $\square 7 \times 723$

r. $\square 583 \times 6$

s. $4 \times 1,237$

t. $\square 8 \times 4,943$

u. $\square 1,193 \times 5$

v. $\square 1,673 \times 8$

3. Use the distributive property to solve each problem as in the example.

► Example: $5 \times 432 = 5 \times (400 + 30 + 2)$
 $= [5 \times 400] + [5 \times 30] + [5 \times 2]$
 $= 2,000 + 150 + 10 = 2,160$

a. 8×35

b. 7×68

c. 2×724

d. 3×684

e. 5×135

f. 8×214

g. 9×463

h. $3 \times 1,476$

i. $9 \times 4,523$

j. $4 \times 9,035$

k. $7 \times 6,003$

l. $8 \times 2,560$

m. 534×6

n. $4,127 \times 3$

4. Find the result of each of the following.

o

a. 3×29

b. 5×64

c. 7×123

d. 94×6

e. $8 \times 1,374$

f. $2,317 \times 2$

5. Put (✓) for the correct statement and (✗) for the incorrect one.

a. $8 \times 245 = 1,960$

[]

b. $6 \times 34 = [6 \times 3] + [6 \times 4]$

[]

c. $7 \times 100 + 7 \times 50 + 7 \times 3 = 7 \times 153$

[]

d. $33 \times 9 = 2,727$

[]

e. $5 \times 440 = 5 \times 40 + 5 \times 4$

[]

f. $202 \times 7 = 1,414$

[]

6. Complete.

a. $5 \times 467 = 5 \times 400 + 5 \times \underline{\quad} + 5 \times 7$

b. $2 \times 139 = 2 \times \underline{\quad} + 2 \times \underline{\quad} + 2 \times 9$

c. $4 \times 7,346 = 4 \times \underline{\quad} + 4 \times 300 + 4 \times \underline{\quad} + 4 \times 6$

d. $8 \times \underline{\quad} = 8 \times 500 + 8 \times 90 + 8 \times 2$

e. $241 \times \underline{\quad} = 6 \times 200 + 6 \times 40 + 6 \times 1$

f. $3 \times 1,805 = 3 \times \underline{\quad} + 3 \times \underline{\quad} + 3 \times \underline{\quad}$

- Error Analysis.** Examine the student work that follows. Identify what the student did correctly and incorrectly, and then try to solve the problem correctly.
- A student solved the problem 36×8 in the following way:

$$\begin{array}{r}
 & 3 & 6 \\
 & \times 8 & \\
 \hline
 & 8 \times 3 & 8 \times 6 \\
 & = 24 & = 48 \\
 & + 24 & \\
 \hline
 & 72 &
 \end{array}$$

$36 \times 8 = 72$

Explain your thinking.

8. Answer each of the following problems. Draw an area model to help you if needed.

a. A runner covers 634 meters in a minute.

o Calculate the distance he covers in 4 minutes with the same speed.

b. A city bus is 1,280 centimeters long. What is the length of 3 city buses?

c. A trader bought 7 fridges. The price of each fridge is 9,245 pounds. What is the total price of the fridges?

d. A family bought 6 kilograms of meat for 143 pounds a kilogram and 8 liters of juice for 27 pounds a liter. How much money did the family pay?

e. Animal Company.

- Multiply. Match each letter to its answer in the blank below to solve the riddle. Some letters are not used.



C	B	Z	A
7×34	4×124	56×8	49×5
O	R	M	N
49×2	$3 \times 2,114$	6×79	9×59

$\frac{1}{2}$	$\frac{4}{4}$	$\frac{9}{9}$	$\frac{5}{5}$
245	474	98	496

Multiple Choice Questions

D

Choose the correct answer.

1.  

- A. 24×2 B. 24×3
 C. 14×3 D. 14×2

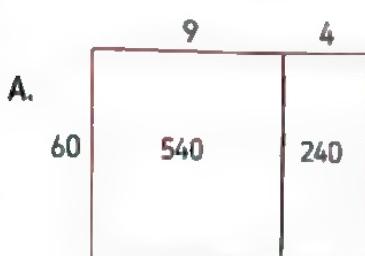
3. $7 \times 509 =$ _____
 A. $(7 \times 5) + (7 \times 9)$ B. $(7 \times 50) + (7 \times 9)$
 C. $(7 \times 5) + (7 \times 90)$ D. $(7 \times 500) + (7 \times 9)$

5. $4 \times 237 =$ _____
 A. 938 B. 944
 C. 964 D. 948

7. $8 \times 450 =$ _____
 A. 36,000 B. 36 tens
 C. 36 Hundreds D. 36

9. Bassem saves 746 pounds monthly, then how much money does he save in 9 months?
 A. 6,514 B. 6,714 C. 6,914 D. 6,974

10. Which area model best represents 69×4 ?



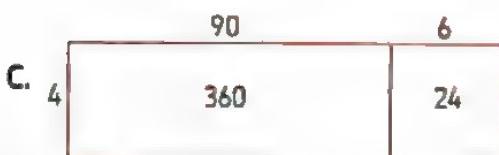
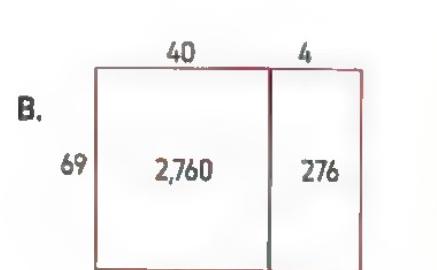
2. 5 

- A. $[5 \times 3] + [5 \times 4]$
 B. $[5 \times 30] + [5 \times 40]$
 C. $(5 \times 30) + (5 \times 4)$
 D. $[5 \times 3] + [5 \times 40]$

4. $[6 \times 40] + [6 \times 8] =$ _____
 A. 6×48 B. 6×84
 C. 6×480 D. 6×12

6. $1,663 \times 9 =$ _____
 A. 14,937 B. 14,967
 C. 14,976 D. 15,967

8. $5 \times 30 + 5 =$ _____
 A. 5×30 B. 5×31
 C. 5×13 D. 5×35



11. What is the correct way to use the area model to multiply 362×8 ?

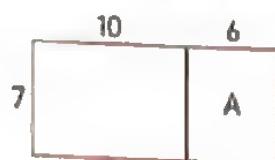


- A. $[300 \times 8] + [60 \times 8] + [2 \times 8]$
 B. $[360 \times 2] + [62 \times 8]$
 C. $(300 \times 8) \times (60 \times 8) \times (2 \times 8)$
 D. $[360 \times 8] \times [2 \times 8]$

12. Which choice correctly uses the Distributive Property of Multiplication to find the product of 429×7 ?

- A. $[4 \times 7] + [2 \times 7] + [9 \times 7]$
 B. $[400 \times 7] + [20 \times 7] + [9 \times 7]$
 C. $[4 + 7] \times [2 + 7] \times [9 + 7]$
 D. $[400 + 7] \times [20 + 7] \times [9 + 7]$

13. The area model represents 16×7 . What number representing the area of rectangle A?



- A. 7
 B. 70
 C. 42
 D. 420

14. Based on the area model, what is 531×6 ?



- A. 54
 B. 486
 C. 3,186
 D. 30,186

15. Which statements correctly represent the product $1,385 \times 4$? Choose **two** correct answers.

- A. $1,385 \times 4 = [4 \times 1,000] + [4 \times 300] + [4 \times 80] + [4 \times 5]$
 B. $1,385 \times 4 = [13 \times 4] + [85 \times 4]$
 C. $1,385 \times 4 = 1,000 + 300 + 80 + 20$
 D. $1,385 \times 4 = 4,000 + 1,200 + 320 + 20$
 E. $1,385 \times 4 = 1,000 + 300 + 80 + [5 \times 4]$

Lesson
2

7-3 The Partial Products Algorithm
7-4 The Standard Multiplication Algorithm
7-5 Review Connecting Strategies

Learn The partial products algorithm

At the Zoo, you can take a ride around the pond on a boat.

If it takes 16 minutes to go around the pond in the boat, how many minutes does it take to go around the pond twice?

Multiply : 16×2

Use the partial products algorithm as follows.



Step 1
Multiply the tens.

$$\begin{array}{r} 16 \\ \times 2 \\ \hline 20 \end{array} \rightarrow [10 \times 2]$$

Step 2
Multiply the ones.

$$\begin{array}{r} 16 \\ \times 2 \\ \hline 20 \\ 12 \end{array} \rightarrow [6 \times 2]$$

Step 3
Add the products.

$$\begin{array}{r} 16 \\ \times 2 \\ \hline 20 \\ + 12 \\ \hline 32 \end{array}$$

So, it takes 32 minutes.

Hint

You can multiply the ones first, then multiply the tens as follows.

Step 1
Multiply the ones.

$$\begin{array}{r} 16 \\ \times 2 \\ \hline 12 \end{array} \rightarrow [6 \times 2]$$

Step 2
Multiply the tens.

$$\begin{array}{r} 16 \\ \times 2 \\ \hline 12 \\ 20 \end{array} \rightarrow [10 \times 2]$$

Step 3
Add the products.

$$\begin{array}{r} 16 \\ \times 2 \\ \hline 12 \\ + 20 \\ \hline 32 \end{array}$$

Notes for parents :

- Your child should recognize that the commutative property of multiplication allows us to write the factors in any order.

Example 1

Use the partial products algorithm to solve the following.

a. 76×3

b. 8×214

c. $6 \times 1,352$

Solution [V]

$$\begin{array}{r} 76 \\ \times 3 \\ \hline 210 \end{array}$$

$\rightarrow [70 \times 3]$ "Multiplying the tens"

$\begin{array}{r} + 18 \\ \hline 228 \end{array}$ $\rightarrow [6 \times 3]$ "Multiplying the ones"

$$\begin{array}{r} 214 \\ \times 8 \\ \hline 1,600 \\ + 80 \\ \hline 1,712 \end{array}$$

$\rightarrow [200 \times 8]$ "Multiplying the hundreds"

$+ 80 \rightarrow [10 \times 8]$ "Multiplying the tens"

$+ 32 \rightarrow [4 \times 8]$ "Multiplying the ones"

$$\begin{array}{r} 1,352 \\ \times 6 \\ \hline 6,000 \\ + 1,800 \\ + 300 \\ + 12 \\ \hline 8,112 \end{array}$$

$\rightarrow [1,000 \times 6]$ "Multiplying the thousands"

$+ 1,800 \rightarrow [300 \times 6]$ "Multiplying the hundreds"

$+ 300 \rightarrow [50 \times 6]$ "Multiplying the tens"

$+ 12 \rightarrow [2 \times 6]$ "Multiplying the ones"



check your understanding

Fill in the blanks with the missing numbers to multiply.

a. 35

$\times 5$

$\underline{150}$ [$\underline{\quad} \times \underline{\quad}$])

$\begin{array}{r} + 25 \\ \hline 175 \end{array}$

b. 254

$\times 6$

$\underline{\quad}$ [6×200])

$\begin{array}{r} + 300 \\ \hline \end{array}$ [$6 \times \underline{\quad}$])

$\begin{array}{r} + \underline{\quad} \\ \hline \end{array}$ [6×4])

- Remind your child to line up the products carefully according to the place value.

Learn**The standard multiplication algorithm**

Maha has a book case with 3 shelves.
There are 24 books on each shelf.
How many books are there in all?

Find: 24×3

You can use the standard multiplication algorithm.

**Step 1**

Multiply the ones.

$$3 \times 4 \text{ ones} = 12 \text{ ones}$$

Regroup the ones.

$$\begin{array}{r} 1 \\ 24 \\ \times 3 \\ \hline 2 \end{array}$$

Regroup
12 ones as
1 ten and
2 ones

Multiply the tens.

$$3 \times 2 \text{ tens} = 6 \text{ tens}$$

, then add the

regrouped ten

$$6 \text{ tens} + 1 \text{ ten} = 7 \text{ tens}$$

$$\begin{array}{r} 1 \\ 24 \\ \times 3 \\ \hline 2 \\ + 70 \\ \hline 72 \end{array}$$

So, there are 72 books in all.

Example 2

Use the standard multiplication algorithm to solve the following.

a. 6×512

b. $2,194 \times 7$

Solution

$$\begin{array}{r} 1 \\ 512 \\ \times 6 \\ \hline 2 \\ + 70 \\ + 3,000 \\ \hline 3,072 \end{array}$$

2 → [$6 \times 2 \text{ ones} = 12 \text{ ones} = 1 \text{ ten} + 2 \text{ ones}$]

+ 70 → [$6 \times 1 \text{ ten} = 6 \text{ tens}$, $6 \text{ tens} + 1 \text{ ten} = 7 \text{ tens}$]

+ 3,000 → [$6 \times 5 \text{ hundreds} = 30 \text{ hundreds} = 3 \text{ thousands}$]

**Notes for parents :**

- Your child sometimes has difficulty demonstrating proper regrouping when using the standard algorithm for multiplication. He/She may omit writing the digit above the correct place or he/she may attempt to place two digits at a time in the product.

b.

$$\begin{array}{r}
 & \overset{1}{\cancel{6}} \\
 2,194 & \\
 \times & 7 \\
 \hline
 8 \rightarrow [7 \times 4 \text{ ones} = 28 \text{ ones} = 2 \text{ tens} + 8 \text{ ones}] & \\
 + 50 \rightarrow [7 \times 9 \text{ tens} = 63 \text{ tens}, 63 \text{ tens} + 2 \text{ tens} = 65 \text{ tens} = 6 \text{ hundreds} + 5 \text{ tens}] & \\
 + 300 \rightarrow [7 \times 1 \text{ hundred} = 7 \text{ hundreds}, 7 \text{ hundreds} + 6 \text{ hundreds} \\
 & = 13 \text{ hundreds} = 1 \text{ thousand} + 3 \text{ hundreds}] \\
 + 15,000 \rightarrow [7 \times 2 \text{ thousands} = 14 \text{ thousands}, 14 \text{ thousands} + 1 \text{ thousand} = 15 \text{ thousands}] \\
 \hline
 15,358
 \end{array}$$

Hint

You can write the products in a short way as the following examples.

Example 3Find $3 \times 1,276$ **Solution** **Step 1**

Multiply the ones.

$$\begin{array}{r}
 & 1 \\
 1,276 & \\
 \times & 3 \\
 \hline
 8
 \end{array}$$

Step 2

Multiply the tens.

$$\begin{array}{r}
 & 21 \\
 1,276 & \\
 \times & 3 \\
 \hline
 28
 \end{array}$$

Step 3

Multiply the hundred.

$$\begin{array}{r}
 & 21 \\
 1,276 & \\
 \times & 3 \\
 \hline
 828
 \end{array}$$

Step 4

Multiply the thousands.

$$\begin{array}{r}
 & 21 \\
 1,276 & \\
 \times & 3 \\
 \hline
 3,828
 \end{array}$$

More Examples :

a.

$$\begin{array}{r}
 & 11 \\
 234 & \\
 \times & 3 \\
 \hline
 702
 \end{array}$$

b.

$$\begin{array}{r}
 & 31 \\
 852 & \\
 \times & 6 \\
 \hline
 5,112
 \end{array}$$

c.

$$\begin{array}{r}
 & 2 & 1 \\
 2,814 & \\
 \times & 3 \\
 \hline
 8,442
 \end{array}$$

d.

$$\begin{array}{r}
 & 6 & 4 & 2 \\
 3,964 & \\
 \times & 7 \\
 \hline
 27,748
 \end{array}$$

**Check** your understanding

Find the products.

a. 56×4

b. 3×174

c. $4,015$

• Train your child to use the short way to find the products.

Learn**Estimate products. Choose a strategy****Example 4**

Estimate the product. Multiply to check.

a. 3×62

b. 284×7

Solution

a. Round 62 to the greatest place value.

$$\begin{array}{r} 3 \times 62 \\ \downarrow \\ 3 \times 60 = 180 \end{array}$$

You can use any multiplication strategy to find the actual product.



The actual product : (Using Area Model Strategy)

$$\begin{array}{ccc} & 60 & 2 \\ 3 & \boxed{3 \times 60 = 180} & \boxed{3 \times 2 = 6} \end{array}$$

$$3 \times 62 = 180 + 6 = 186$$

b.

Round to the nearest ten

$$\begin{array}{r} 284 \longrightarrow 280 \\ \times 7 \quad \times 7 \\ \hline 1,960 \end{array}$$

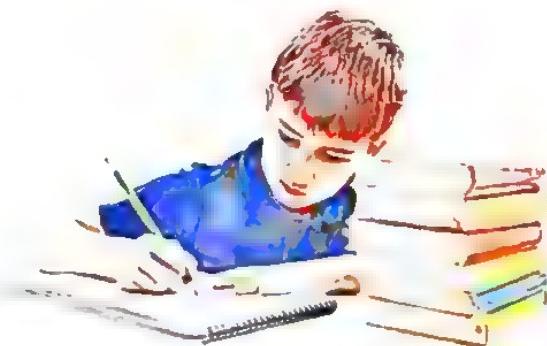
Or

Round to the nearest hundred

$$\begin{array}{r} 284 \longrightarrow 300 \\ \times 7 \quad \times 7 \\ \hline 2,100 \end{array}$$

The actual product : (Using the Standard Multiplication Strategy)

$$\begin{array}{r} 52 \\ 284 \\ \times \quad 7 \\ \hline 8 \\ + \quad 80 \\ + 1,900 \\ \hline 1,988 \end{array}$$

**Notes for parents :**

- Let your child use rounding to check the reasonableness of the answer.

Example 5

Samy says that $7 \times 58 = 91$

Describe Samy's error and find
the correct product.

$$\begin{array}{r}
 \text{ooooooo} \\
 58 \\
 \times 7 \\
 \hline
 35 \\
 + 56 \\
 \hline
 91
 \end{array}$$

Solution

The error is multiplying the tens $7 \times 50 = 35$ instead
of $7 \times 50 = 350$
The correct product is 406

$$\begin{array}{r}
 58 \\
 \times 7 \\
 \hline
 350 \longrightarrow (7 \times 50) \\
 + 56 \longrightarrow (7 \times 8) \\
 \hline
 406
 \end{array}$$

**Check** your understanding

Estimate the product. Choose a strategy to find the actual product.

a. 87
 $\underline{\times 6}$

b. 764
 $\underline{\times 5}$

c. 4×341



- Your child may have difficulty determining the number of zeros in a product when multiplying by multiples of 10, especially when the product of the basic fact ends in zero. For example, your child may think that $80 \times 5 = 40$ rather than 400.

Exercise**35**
7-3 The Partial Products Algorithm
7-4 The Standard Multiplication Algorithm
7-5 Review Connecting Strategies

REMEMBER

LEARN

APPLY

PROBLEM SOLVING

From the school book

1. Fill in the blanks with the missing numbers.

a.

$$\begin{array}{r}
 28 \\
 \times 6 \\
 \hline
 120 \quad [\text{---} \times \text{---}] \\
 + 48 \quad [\text{---} \times \text{---}] \\
 \hline
 168
 \end{array}$$

b.

$$\begin{array}{r}
 239 \\
 \times 7 \\
 \hline
 1,400 \quad [\text{---} \times \text{---}] \\
 + 210 \quad [\text{---} \times \text{---}] \\
 + 63 \quad [\text{---} \times \text{---}] \\
 \hline
 1,673
 \end{array}$$

c.

$$\begin{array}{r}
 1,485 \\
 \times 2 \\
 \hline
 2,000 \quad [\text{---} \times \text{---}] \\
 + 800 \quad [\text{---} \times \text{---}] \\
 + 160 \quad [\text{---} \times \text{---}] \\
 + 10 \quad [\text{---} \times \text{---}] \\
 \hline
 2,970
 \end{array}$$

d.

$$\begin{array}{r}
 634 \\
 \times 5 \\
 \hline
 \text{---} \quad [5 \times 600] \\
 + 150 \quad [\text{---} \times \text{---}] \\
 + \text{---} \quad [5 \times 4] \\
 \hline
 \text{---}
 \end{array}$$

e.

$$\begin{array}{r}
 2,523 \\
 \times 5 \\
 \hline
 10,000 \quad [\text{---} \times 2,000] \\
 + \text{---} \quad [5 \times 500] \\
 + 100 \quad [5 \times \text{---}] \\
 + \text{---} \quad [5 \times 3] \\
 \hline
 \text{---}
 \end{array}$$

f.

$$\begin{array}{r}
 6,421 \\
 \times 6 \\
 \hline
 36,000 \quad [\text{---} \times \text{---}] \\
 + \text{---} \quad [6 \times 400] \\
 + 120 \quad [6 \times \text{---}] \\
 + \text{---} \quad [6 \times 1] \\
 \hline
 \text{---}
 \end{array}$$

2. Solve using the partial products algorithm.

a. 8×67

b. 129×4

c. 5×343

d. 6×678

e. 284×4

f. 305×7

g. $3 \times 2,539$

h. $4,731 \times 4$

3. Estimate the product, then solve using the standard algorithm as in the example.

Example

$$\begin{array}{r} 38 \\ \times 7 \\ \hline \end{array}$$

Estimate

$$\begin{array}{r} 40 \\ \times 7 \\ \hline 280 \end{array}$$

Answer

$$\begin{array}{r} 5 \\ 38 \\ \times 7 \\ \hline 6 \\ + 260 \\ \hline 266 \end{array}$$

a. $\begin{array}{r} 17 \\ \times 6 \\ \hline \end{array}$

Estimate

Answer

b. $\begin{array}{r} 32 \\ \times 3 \\ \hline \end{array}$

Estimate

Answer

c. $\begin{array}{r} 289 \\ \times 4 \\ \hline \end{array}$

Estimate

Answer

d. $\begin{array}{r} 134 \\ \times 2 \\ \hline \end{array}$

Estimate

Answer

e. $\begin{array}{r} 758 \\ \times 3 \\ \hline \end{array}$

Estimate

Answer

f. $\begin{array}{r} 1,349 \\ \times 2 \\ \hline \end{array}$

Estimate

Answer

g. $\begin{array}{r} 4,917 \\ \times 5 \\ \hline \end{array}$

Estimate

Answer

h. $\begin{array}{r} 2,327 \\ \times 4 \\ \hline \end{array}$

Estimate

Answer

4. Solve using the standard algorithm.

a. 7×30

b. 27×3

c. 4×800

d. 284×4

e. 630×5

f. 204×2

g. 735×5

h. $1,390 \times 2$

i. $2,213 \times 4$

5. Compare. Write " $<$ ", " $>$ ", or " $=$ " for each .

a. 4×326 3×467

b. 8×199 5×321

c. $2 \times 3,750$ $3 \times 2,500$

d. 5×272 6×231

e. 7×408 6×476

f. $4 \times 7,424$ $8 \times 3,695$

- 6. What's the Error?** Hany made an error in his multiplication. Describe his error, and explain how to find the correct answer.

Hany

$$\begin{array}{r}
 & 2 \\
 2,206 & \times 4 \\
 \hline
 8,884
 \end{array}$$

- 7. . .** Three students tried solving 328×2 using the standard algorithm. Explain who you think solved the problem correctly and identify at least one error in another student's solution.

Student 1

$$\begin{array}{r}
 328 \\
 \times 2 \\
 \hline
 646
 \end{array}$$

Student 2

$$\begin{array}{r}
 1 \\
 328 \\
 \times 2 \\
 \hline
 656
 \end{array}$$

Student 3

$$\begin{array}{r}
 1 \\
 328 \\
 \times 2 \\
 \hline
 746
 \end{array}$$

- 8. How can you tell without solving the whole problem whether 53×7 is less than or greater than 350?**

9. Fix the Error.

- Look at the standard algorithm solution for each multiplication problem. Circle the problem if the solution is correct. If the solution is incorrect, fix the error.

$$\begin{array}{r}
 2 \\
 158 \\
 \times 3 \\
 \hline
 374
 \end{array}$$

$$\begin{array}{r}
 21 \\
 3,142 \\
 \times 5 \\
 \hline
 15,710
 \end{array}$$

$$\begin{array}{r}
 98 \\
 \times 2 \\
 \hline
 86
 \end{array}$$

$$\begin{array}{r}
 1 \\
 470 \\
 \times 4 \\
 \hline
 1,880
 \end{array}$$

$$\begin{array}{r}
 143 \\
 1,286 \\
 \times 6 \\
 \hline
 6,286
 \end{array}$$



Challenge

- 10. Find the missing numbers on Manal paper.**
Explain your thinking.

Manal

$$\begin{array}{r}
 \text{ } \text{ } \text{ } \text{ } \text{ } \text{ } \\
 4,623 \\
 \times \text{ } \\
 \hline
 36,9 \text{ } 4
 \end{array}$$

Multiple Choice Questions

Choose the correct answer.

$$1. \begin{array}{r} 54 \\ \times 7 \\ \hline \end{array}$$

- A. 63 B. 378
C. 278 D. 368

$$2. \begin{array}{r} 235 \\ \times 6 \\ \hline \end{array}$$

- A. 60 B. 1,200
C. 1,410 D. 3,192

$$3. 2 \times 1,324 = \underline{\hspace{2cm}}$$

- D. A. 2,648 B. 8,462
C. 26,480 D. 2,688

$$4. 504 \times 6 = \underline{\hspace{2cm}}$$

- B. A. 324 B. 30,240
C. 3,240 D. 3,024

5. The product of 192×3 is near close

- to $\underline{\hspace{2cm}}$
A. 400 B. 500
C. 600 D. 700

6. Which product is NOT correct ?

- A. $63 \times 4 = 252$
- B. $3 \times 48 = 144$
- C. $7 \times 27 = 149$
- D. $6 \times 153 = 918$

7. Which statement is true ? "Estimate"

- A. The product of 3 and 27 is less than 60.
- B. The product of 5 and 41 is less than 200.
- C. The product of 4 and 113 is greater than 400.
- D. The product of 7 and 98 is greater than 700.

8. What is the ones digit of the product of 53×6 will be without solving the whole problem ?

- A. 3 B. 6 C. 8 D. 9

7-6 Two-Digit Multiplication

7-7 Area Models and Two-Digit Multiplication

Learn

Multiplying two multiples of 10

Essam bought 20 statues for 30 pounds each as souvenirs, how much money did he pay?



Remember

The numbers 10, 20, 30, 40, ... are multiples of 10.

Multiply: 20×30

How to find the product of 20×30 .

$$20 \times 30 = 600$$

- Multiply $2 \times 3 = 6$ (Basic Fact)

- Put 00 on the right to get the number 600.

So, he paid 600 pounds.

$$20 \times 30 = 600$$



Notes for parents :

- Let your child notice that the product has as many zeroes as the total number of zeroes in the factors plus any additional zeroes in the basic fact product.

Example 1

Find the product.

a. 50×30

Solution

a. $50 \times 30 = 1,500$

b. 40×70

b. $40 \times 70 = 2,800$

Another Solution

a. $50 \times 30 = [5 \times 10] \times [3 \times 10]$
 $= 5 \times 3 \times 10 \times 10$ "Commutative property"
 $= [5 \times 3] \times [10 \times 10]$ "Associative property"
 $= 15 \times 100 = 1,500$

b. $40 \times 70 = [4 \times 10] \times [7 \times 10]$
 $= [4 \times 7] \times [10 \times 10]$
 $= 28 \times 100$
 $= 2,800$

You can use
the properties of
multiplication



check your understanding

1. Multiply : 70×40

a. Find the product of 7 and 4 _____

b. How many zeroes are in the two factors ? _____

c. Write the product of 70 and 40 _____

2. Multiply : 80×90

a. Find the product of 8 and 9. _____

b. How many zeroes are in the two factors ? _____

c. Write the product of 80 and 90 _____

Let your child notice the number of zeroes in each product.

Learn**Multiplying a 2-digit number by a multiple of 10**

A primary school is formed of 30 classes of 25 pupils each.

Calculate the total number of pupils.

Multiply: 30×25

You can use the area model.

20	5
30	$30 \times 20 = 600$
	$30 \times 5 = 150$



$$30 \times 25 = 600 + 150 = 750$$

So, the total number of pupils is 750.

Example 2

Multiply.

a. 60×17

b. 48×90

Solution

a. $60 \times 17 = 600 + 420$
 $= 1,020$

10	7
60	$60 \times 10 = 600$
	$60 \times 7 = 420$

b. $48 \times 90 = 3,600 + 720$
 $= 4,320$

40	8
90	$90 \times 40 = 3,600$
	$90 \times 8 = 720$

Check your understanding

► Multiply: 28×70

Work area

Notes for parents :

- Let your child notice that the product of any number and a multiple of 10 has a zero in the ones place

Learn**Area models and two-digit multiplication.**

Bassem bought 12 books to read. Each book costs 47 pounds.
How much money did Bassem pay?

Multiply: 12×47

You can use the area model as follows.

$$\bullet 12 = 10 + 2 \quad \bullet 47 = 40 + 7$$

		47
	x	40
12	10	$10 \times 40 = 400$
2	2	$2 \times 40 = 80$

	7
	$10 \times 7 = 70$
	$2 \times 7 = 14$

$$12 \times 47 = 400 + 70 + 80 + 14 = 564$$

So, Bassem paid 564 pounds.

**Example 3**

Use the area model to solve the following.

a. 74×33

b. 49×56

Solution

a. $\bullet 74 = 70 + 4$ $\bullet 33 = 30 + 3$

x	30	3
70	$70 \times 30 = 2,100$	$70 \times 3 = 210$
4	$4 \times 30 = 120$	$4 \times 3 = 12$

$$74 \times 33 = 2,100 + 210 + 120 + 12 = 2,442$$

b. $\bullet 49 = 40 + 9$ $\bullet 56 = 50 + 6$

x	40	9
50	$50 \times 40 = 2,000$	$50 \times 9 = 450$
6	$6 \times 40 = 240$	$6 \times 9 = 54$

$$49 \times 56 = 2,000 + 450 + 240 + 54 = 2,744$$

Check

your understanding

► Multiply: 41×36

- Let your child write the factors in expanded form before finding product.

- Make sure that your child multiplies the correct numbers together.

Exercise**36****7-6 Two-Digit Multiplication****7-7 Area Models and Two-Digit Multiplication**

REMEMBER

FACTS

GAMES

PROBLEM SOLVING

From the school book

1. Find the following products.

a. $20 \times 40 =$ _____

b. $130 \times 50 =$ _____

c. $120 \times 80 =$ _____

d. $40 \times 70 =$ _____

e. $150 \times 60 =$ _____

f. $30 \times 90 =$ _____

g. $140 \times 40 =$ _____

h. $50 \times 90 =$ _____

i. $60 \times 20 =$ _____

j. $50 \times 80 =$ _____

k. $60 \times 30 =$ _____

l. $60 \times 80 =$ _____

m. $70 \times 70 =$ _____

n. $80 \times 70 =$ _____

o. $90 \times 70 =$ _____

p. $80 \times 80 =$ _____

q. $80 \times 90 =$ _____

r. $90 \times 90 =$ _____

2. Complete the table.

	Problem	Area Model	Numbers and symbols
a.	40×62	_____	2,480
b.	70×55	_____	_____
c.	54×30	_____	_____
d.	40×78	_____	_____
e.	44×20	_____	_____
f.	15×30	_____	_____
g.	10×40	_____	_____
h.	72×40	_____	_____

5. Solve.

a. $\square \square 10 \times 56 =$

c. $20 \times 66 =$

e. $\square \square 30 \times 78 =$

g. $70 \times 87 =$

b. $\square \square 20 \times 54 =$

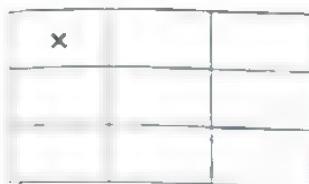
d. $30 \times 18 =$

f. $\square \square 23 \times 40 =$

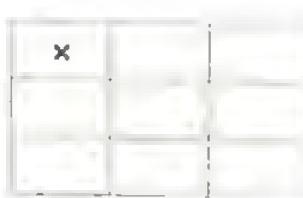
h. $\square \square 190 \times 32 =$

Create area models to solve the problems.

a. 81×23



b. 45×28



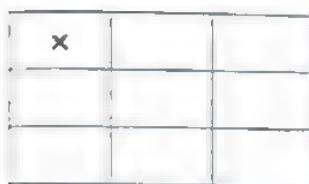
c. 60×12



d. 22×17



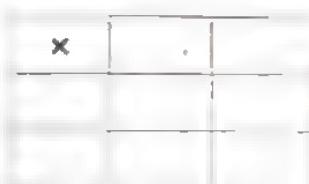
e. 34×19



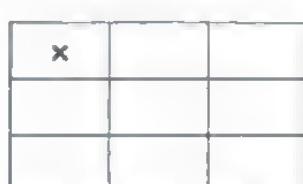
f. 72×15



g. 24×37



h. 45×29



i. 61×26



j. 58×44



5. 1.1 Error Analysis

- Examine the student's work. Is his answer reasonable? How do you know? Explain your thinking.
- $22 \times 50 = [20 + 2] \times 50 = [20 \times 50] + [2 \times 50] = 100 + 100 = 200$

6. Answer the following.

- a. A merchant bought 20 boxes of soft drinks for 40 pounds each.
How much money did he pay?



- b. A group of 38 people want to travel by bus.
Each bus ticket costs 30 LE. How much do they need to pay in all?



- c. The book store ordered 34 boxes of a new book.
There were 24 books in each box. How many copies of the book did they receive?



- d. Mina runs 14 hours every week.
What is the number of running hours in 29 weeks?



- e. A jar of sweets holds 84 sweets.
How many sweets are there in 16 jars?



Multiple Choice Questions

Choose the correct answer.

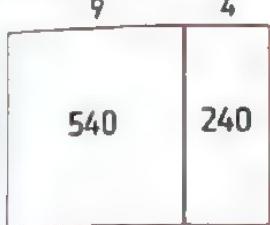
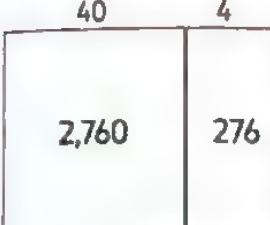
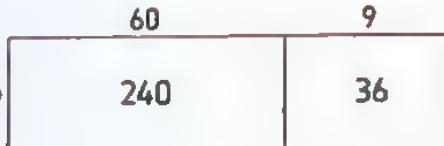
1. $40 \times 90 =$ _____

- A. 36
- B. 360
- C. 3,600
- D. 36,000

3. $53 \times 8 =$ _____

- A. 280
- B. 424
- C. 64
- D. 640

5. Which area model best represents 69×4 ?

- A. 
- B. 
- C. 
- D. 

2. _____ $\times 70 = 3,500$

- A. 30
- B. 35
- C. 50
- D. 53

4. $19 \times 30 =$ _____

- A. 57
- B. 1,930
- C. 273
- D. 570

6. John's study group is coming to his house.

• There are 11 people in the group, including John. He would like that each person in the group to have 12 crackers as snacks. Which area model represents this problem?

A.

\times	11	1
12	132	12
2	22	2

B.

\times	1	11
12	12	12
11	11	11

C.

\times	10	1
10	100	10
2	20	2

D.

\times	10	1
1	10	1
2	20	2

7. What is the unknown value in the area model representing 28×53 ?

x	50	3
20	1,000	60
8	?	24

- A. 40
B. 400
C. 4,000
D. 850

8. What is the correct way to use the area model to multiply 54×27 ?

x	50	4
20		
7		

- A. $7 + 20 + 50 + 4 = 81$
B. $1,000 + 350 + 80 = 1,430$
C. $1,000 + 350 + 80 + 28 = 1,458$
D. $10,000 + 350 + 80 + 28 = 10,458$

9. Mona made 11 bracelets. There are 13 beads on each bracelet. How many beads are there on all 8 bracelets?

- A. 130 B. 132 C. 143 D. 156



7-8 Algorithms and Two-Digit Multiplication

7-9 Putting It All Together

Learn Multiplying 2-digit numbers by partial products

A group of 25 students each jumped rope for 13 minutes.

How many minutes in all did they jump rope?

Multiply: 25×13



You can use algorithm of partial products as follows.

Step 1

Multiply the ones by the ones

$$\begin{array}{r} 25 \\ \times 13 \\ \hline 15 \end{array} \quad 3 \times 5 = 15$$

Line up partial products in the correct place value.

Step 2

Multiply the ones by the tens

$$\begin{array}{r} 25 \\ \times 13 \\ \hline 15 \\ 60 \end{array} \quad 3 \times 20 = 60$$



Step 3

Multiply the tens by the ones

$$\begin{array}{r} 25 \\ \times 13 \\ \hline 15 \\ 60 \\ 50 \end{array} \quad 10 \times 5 = 50$$

Step 4

Multiply the tens by the tens. Then add the partial products.

$$\begin{array}{r} 25 \\ \times 13 \\ \hline + 15 \\ + 60 \\ + 50 \\ \hline 200 \end{array} \quad 10 \times 20 = 200$$

So, the number of minutes in all is 325

Notes for parents:

- In this lesson, your child will apply a variety of strategies to solve two-digit by two-digit multiplication problems.

Example 1

Estimate. Then find the product by the algorithm of partial products.

a. 19×42

b. 81×37

Solution 

a.	Estimation	Multiplication
	$19 \times 42 = \underline{\hspace{2cm}}$ ↓ ↓ $20 \times 40 = 800$	$ \begin{array}{r} 19 \\ \times 42 \\ \hline 18 \leftarrow [2 \times 9] \\ + 20 \leftarrow [2 \times 10] \\ \hline + 360 \leftarrow [40 \times 9] \\ + 400 \leftarrow [40 \times 10] \\ \hline 798 \end{array} $

Since, the estimation 800 is close to 798 , then it is reasonable.

b.	Estimation	Multiplication
	$81 \times 37 = \underline{\hspace{2cm}}$ ↓ ↓ $80 \times 40 = 3,200$	$ \begin{array}{r} 81 \\ \times 37 \\ \hline 7 \leftarrow [7 \times 1] \\ + 560 \leftarrow [7 \times 80] \\ + 30 \leftarrow [30 \times 1] \\ + 2,400 \leftarrow [30 \times 80] \\ \hline 2,997 \end{array} $

Since, the estimation 3,200 is close to 2,997 , then it is reasonable.

**Check** your understanding

Copy and complete.

a.

4 5		
\times		
7 2		
<hr/>		
1 0	← [\times]	
+		
8 0	← [\times]	
+		
3 5 0	← [\times]	
+		
2,8 0 0	← [\times]	
<hr/>		
3,2 4 0		

b.

2 3		
\times		
9 8		
<hr/>		
2 4	← [\times]	
+		
1 6 0	← [\times]	
+		
2 7 0	← [\times]	
+		
1,8 0 0	← [\times]	
<hr/>		
2,2 5 4		

Notes for parents :

- Your child may have difficulty decomposing numbers when a problem is written vertically.

Learn**Multiplying 2-digit numbers by standard algorithm**

An animator creates 24 pictures for each second of an animated cartoon.

How many pictures are drawn to make a cartoon that is 45 seconds long?

$$\text{Multiply: } 24 \times 45$$

**Step 1**

Multiply by ones.

$$\begin{array}{r}
 2 \\
 24 \\
 \times 45 \\
 \hline
 120 \leftarrow 5 \times 24
 \end{array}$$

Step 2

Multiply by tens.

$$\begin{array}{r}
 1 \\
 2 \\
 24 \\
 \times 45 \\
 \hline
 120 \\
 960 \leftarrow 40 \times 24
 \end{array}$$

Step 3

Add the products.

$$\begin{array}{r}
 1 \\
 2 \\
 24 \\
 \times 45 \\
 \hline
 120 \\
 + 960 \\
 \hline
 1,080
 \end{array}$$

So, the animator creates 1,080 pictures to make a 45-second cartoon.

Example 2

Multiply by the standard algorithm.

a. 38×17

Solution

$$\begin{array}{r}
 5 \\
 38 \\
 \times 17 \\
 \hline
 266 \leftarrow 7 \times 38 \\
 + 380 \leftarrow 10 \times 38 \\
 \hline
 646
 \end{array}$$

b. 86×54

$$\begin{array}{r}
 3 \\
 86 \\
 \times 54 \\
 \hline
 344 \leftarrow 4 \times 86 \\
 + 4,300 \leftarrow 50 \times 86 \\
 \hline
 4,644
 \end{array}$$

Example 3

The greenhouse has 45 bags of potting soil.

Each bag has enough soil to pot 29 plants.

How many plants can be potted?



- Remind your child that although he/she has been learning different strategies for multiplication, mathematicians work towards being efficient in their calculations. It might take a long time to draw an area model to solve a problem, so they may choose to use an algorithm like partial products or the standard algorithm.

SolutionMultiply: 45×29 **One Way**

Bassem used standard algorithm (regrouping) to find the product.

oooooooooooooooo

Bassem

$$\begin{array}{r}
 & 3 \\
 & 4 \\
 & 2 \ 9 \\
 \times & 4 \ 5 \\
 \hline
 & 1 \ 4 \ 5 \quad [5 \times 29] \\
 + & 1 \ 1 \ 6 \ 0 \quad [40 \times 29] \\
 \hline
 & 1, \ 3 \ 0 \ 5
 \end{array}$$

Another Way

Amgad used partial products.

oooooooooooooooo

Amgad

$$\begin{array}{r}
 & 2 \ 9 \\
 \times & 4 \ 5 \\
 \hline
 & 4 \ 5 \quad [5 \times 9] \\
 + & 1 \ 0 \ 0 \quad [5 \times 20] \\
 + & 3 \ 6 \ 0 \quad [40 \times 9] \\
 + & 8 \ 0 \ 0 \quad [40 \times 20] \\
 \hline
 & 1, \ 3 \ 0 \ 5
 \end{array}$$

So, there is enough soil to pot 1,305 plants.

**check** your understanding

Solve using any strategy.

a. $57 \times 16 =$ _____

b. $24 \times 88 =$ _____

c. $35 \times 62 =$ _____

Notes for parents:

- Help your child make connections between the partial products algorithm, and the standard algorithm for two-digit multiplication. Making these connections helps your child build deep understanding of multiplication processes.

Solve using the partial products algorithm.

a. $14 \times 26 =$

x	

b. $11 \times 38 \times 75 =$

x	

c. $55 \times 48 =$

x	

d. $36 \times 14 =$

x	

e. $24 \times 43 =$

x	

f. $11 \times 44 \times 39 =$

x	

g. $\square \times 53 \times 28 =$

x	

h. $60 \times 18 =$

x	

i. $89 \times 47 =$

x	

2. Solve using the standard algorithm.

a. $52 \times 36 =$

x	
+	

b. $25 \times 78 =$

x	
+	

c. $63 \times 28 =$

x	
+	

d. $21 \times 31 =$

x	
+	

e. $46 \times 25 =$

x	
+	

f. $52 \times 25 =$

x	
+	

g. $39 \times 18 =$

x	
+	

h. $77 \times 33 =$

x	
+	

i. $98 \times 26 =$

x	
+	

3. Solve using any method.

a. $14 \times 29 =$

d. $82 \times 45 =$

g. $99 \times 21 =$

b. $67 \times 21 =$

e. $76 \times 15 =$

h. $54 \times 59 =$

c. $43 \times 34 =$

f. $17 \times 32 =$

i. $83 \times 15 =$

4. put (✓) for the correct statement and (✗) for the incorrect statement.
- a. $35 \times 11 = 385$ []
 - b. $86 \times 42 = 3,512$ []
 - c. $67 \times 75 = (67 \times 5) + (67 \times 7)$ []
 - d. $18 \times 32 = 1,832$ []

5. Use ">, <, or =" for each ○.

- | | | | | | |
|-------------------|---|----------------|-------------------------------------|---|----------------|
| a. 25×44 | ○ | 1,200 | b. 50×40 | ○ | 2,000 |
| c. 18×25 | ○ | 30×15 | d. $[35 \times 7] + [35 \times 10]$ | ○ | 35×71 |
| e. 44×3 | ○ | 33×4 | f. 23×40 | ○ | 92 |

6. What's the Error?

Maged says the product of 84 and 25 is 210. Is he correct? Explain.

7. What's the Error? Describe

Eman's error: Write the correct answer.

○○○○○○○○○○	Eman
6 4	
× 4 3	
1 9 2	
+ 2 5 6	
4 4 8	

8. Mariam ordered 47 binders for her office.

Each binder costs 15 L.E.

How much did the binders cost in all?



Multi steps story problems

9. Answer the following.

- a. Which costs more, 23 off-road buggies or 21 sport cars ? How much more ?



- b. Malik walked 8 kilometers on Friday and 6 kilometers on Saturday. He did this every weekend for 6 weeks. How many kilometers did he walk by the end of 6 weeks ?



- c. Aya paints pictures and sells them at art shows.

She charges 56 L.E. for a large painting. She charges 24 L.E. for a small painting. Last month she sold six large paintings and three small paintings.

How much did she make in all ?



- d. A merchant bought 26 boxes of soft drinks for 88 LE. each, and 46 boxes of sweets for 57 each.

How much money did the merchant pay?



- e. ... The Super Bus has a total of 75 seats. The Super Rail seats are 3 times as many people as the Super Bus and 53 more people than the Super Ferry. How many people do the Super Bus, Super Rail, and Super Ferry seat all together?



- f. On Thursday, the Meat King Market sold 210 kilograms of ground beef. On Friday, it sold twice that amount. On Saturday, it sold only 130 kilograms. How much more meat did the market sell on Friday than on Saturday?

Challenge

10. Find the missing numbers. Explain.

$$\begin{array}{r}
 35 \\
 \times 6\Box \\
 \hline
 1\Box 5 \\
 + 2,100 \\
 \hline
 2,275
 \end{array}$$

Multiple Choice Questions

Choose the correct answer.

1. $93 \times 14 =$

- A. 1,209
- B. 1,496
- C. 1,302
- D. 2,512

3. 15×24

40×90

- A. >
- B. =
- C. <

5. What is the first partial product when you multiply 27×18 ?

- A. 160
- B. 200
- C. 70
- D. 56

7. Ali bought 18 shrubs to plant in his garden. Each shrub cost L.E. 14.
How much did the shrubs cost in all?

- A. L.E. 32
- B. L.E. 252
- C. L.E. 324
- D. L.E. 462

2. $66 \times 22 =$

- A. 1,212
- B. 1,452
- C. 2,266
- D. 2,662

4. What is the ones digit in the product of 34×27 ?

- A. 8
- B. 7
- C. 5
- D. 4

6. What is the last partial product when you multiply 73×28 ?

- A. 14
- B. 140
- C. 1,400
- D. 14,000

2. Choose the closest number to the correct answer without performing the multiplication operation.

a. 29×31

- A. 500
- B. 600
- C. 900
- D. 1,200

b. $| 42 \times 18 |$

- A. 400
- B. 500
- C. 700
- D. 800

c. $| 83 \times 54 |$

- A. 4,000
- B. 5,000
- C. 8,000
- D. 14,000



1. put (✓) to the correct answer and (✗) to the incorrect answer.

a. $5 \times 478 = [5 \times 400] + [5 \times 70] + [5 \times 8]$

()

b. $25 \times 36 = 800$

()

c. $17 \times 4 = 68$

()

d. $3 \times 256 = 768$

()

e. $8 \times 125 = 9$ hundreds

()



f. The area model represents 7×82

()

2. Choose the correct answer.

a. Which choice correctly uses the distributive property of multiplication to find the product of 429×7 ?

A. $[4 \times 7] + [2 \times 7] + [9 \times 7]$

B. $[400 \times 7] + [20 \times 7] + [9 \times 7]$

C. $[4 + 7] \times [2 + 7] \times [9 + 7]$

D. $[400 + 7] \times [20 + 7] \times [9 + 7]$

b. Which partial products can be used to solve 48×4 ?

A. $160 + 12$

B. $80 + 32$

C. $160 + 32$

D. $80 + 12$

c. What is the unknown value in the multiplication problem?

5	4	7
x	8	
?	3	7
6		

A. 2

B. 4

C. 5

D. 9

d. What is the missing value in the area

model representing 29×16 ?

A. 19

B. 90

C. 30

D. 200

20	10	6
9	200	120
	?	54

- e. Which partial products model represents this multiplication problem?

$$\begin{array}{r}
 34 \\
 \times 14 \\
 \hline
 136 \\
 340 \\
 \hline
 476
 \end{array}$$

- A. $(4 \times 4) + (4 \times 10) + (40 \times 4) + (30 \times 10)$
 C. $[4 \times 4] + [4 \times 30] + [10 \times 4] + [10 \times 30]$
 B. $[4 + 4] + [4 + 10] + [30 + 4] + [30 + 10]$
 D. $[4 + 4] \times [4 + 30] \times [10 + 4] \times [10 + 30]$

- f. What is the correct way to use the area model to multiply 362×8 ?



- A. $[300 \times 8] + (60 \times 8) + (2 \times 8)$
 C. $[300 \times 8] \times [60 \times 8] \times (2 \times 8)$
 B. $[360 \times 2] + [62 \times 8]$
 D. $[360 \times 8] \times [2 \times 8]$

3. Complete.

a.

$$\begin{array}{r}
 \boxed{} \\
 54 \\
 \times 6 \\
 \hline
 \boxed{} \boxed{} \boxed{}
 \end{array}$$

b.

$$\begin{array}{r}
 \boxed{} \boxed{} \\
 322 \\
 \times 7 \\
 \hline
 \boxed{} \boxed{} \boxed{} \boxed{}
 \end{array}$$

c.

$$\begin{array}{r}
 49 \\
 \times 26 \\
 \hline
 \underline{\quad} \\
 + \underline{\quad} \\
 \hline
 \end{array}$$

d.

$$\begin{array}{r}
 19 \\
 \times 82 \\
 \hline
 \underline{\quad} \\
 + \underline{\quad} \\
 \hline
 \end{array}$$

e. $62 \times 9 = \underline{\quad}$

f. $58 \times 23 = \underline{\quad}$

4. Put ">, < or =".

a. 6×35



$[30 \times 6] \times [5 \times 6]$

b. 167×4



$400 + 240 + 28$

c. 29×31



28×32

d. 8×375



15×20

5. Multiply 46×7
6. Find the product of 38×18
7. Use the area model to solve 9×154
8. How can you tell what the ones digit of the product of 54×6 will be without solving the whole problem?
9. Amal says "To find 4×13 , I can add 12 and 40." Do you agree or disagree? Explain.
10. How can you tell that 5×76 will be at least 3 digits?
11. Bassem reads books in a series of mysteries. Each book has 128 pages. How many pages will Bassem read if he finishes 9 of these books?
12. Eslam's school has 26 classrooms. If each class donates 52 cans of food to charity, how many cans will be donated?



Concept

2

Dividing by 1-Digit Divisors



Fast Fact

Cheetah is the fastest land animal in the world. A cheetah can reach 112 kilometers per hour.

If a cheetah ran for quarter an hour at its fastest speed, how far could it run?



Concept Overview

In concept 2:

Dividing by One-Digit Divisors, students build on their learning in primary 3 to deepen and extend their understanding of division and improve their procedural fluency. They explore three different strategies for multiplying the area model strategy, the partial products algorithm, and the standard algorithm. They apply their knowledge of place value, patterns when dividing multiples of 10 by one-digit numbers, and multiplication facts to solve division problems. They use the relationship between multiplication and division to check quotients. Good mathematicians make connections between mathematical concepts and use those connections to solve problems. This concept encourages that practice. Students end the concept by solving challenging story problems involving all four operations.

Lesson No	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 5	7-10 Exploring Remainders	Dividend - Divisor - Quotient - Remainder	<ul style="list-style-type: none">Students will identify the dividend, divisor, and quotient of a division problem.Students will solve division problems.Students will explain what a remainder represents in a division problem.
Lesson 6	7-11 Patterns and Place Value in Division	Dividend - Divisor - Quotient - Remainder	<ul style="list-style-type: none">Students will use place value, multiplication facts, and patterns with zeros to divide multiples of 10, 100 and 1,000 by one-digit divisors.
Lesson 7	7-12 The Area Model and Division	Area model - Dividend - Divisor - Quotient - Remainder	<ul style="list-style-type: none">Students will use area models to represent and solve division problems.
Lesson 8	7-13 The Partial Quotients Algorithm	Partial quotients algorithm	<ul style="list-style-type: none">Students will use the partial quotients algorithm to divide dividends with up to four digits by one-digit divisors.
	7-14 The Standard Division Algorithm	Standard algorithm - Regroup	<ul style="list-style-type: none">Students will estimate quotients using properties of place value and patterns in multiplication and division.Students will use the standard algorithm to solve division problems.
Lesson 9	7-15 Division and Multiplication	Accuracy - Reasonable - Regroup	<ul style="list-style-type: none">Students will use properties of place value to accurately record quotients.Students will use the relationship between multiplication and division to check the accuracy of quotients.
	7-16 Solving Challenging Story Problems	Review vocabulary as needed	<ul style="list-style-type: none">Students will organize information in story problems to determine when to add, subtract, multiply or divide.Students will solve story problems using addition, subtraction, multiplication and division.

7-10 Exploring Remainders

Learn

Three friends are playing a game of dominoes. There are 28 dominoes in the set. If each player receives the same number of dominoes, how many dominoes will each player get? How many dominoes will be left over?

- This problem would be solved using **division**. Sometimes a number cannot be divided evenly. The amount left over is called the **remainder**.

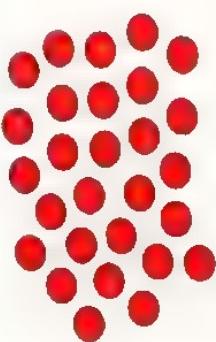


Divide : 28 by 3.

Write $28 \div 3$

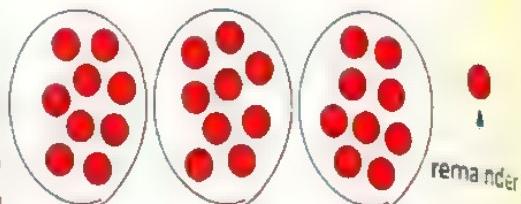
Step 1

Use 28 counters



Step 2

Draw 3 circles. Divide the 28 counters into 3 equal groups. The counter left over is the remainder.



The quotient is 9 and the remainder is 1

$$\text{Then: } 28 \div 3 = 9 \text{ R}1$$

↑ ↑ ↑ ↓
dividend divisor quotient remainder

So, each player will get 9 dominoes.

There will be 1 domino left over.

Math Hint

The sum of the digit 2 and 8 is 10 and 10 is not existing when skip counting by 3s so, there will be a remainder.

Note that

If the number is divided equally, the remainder is 0

Examples : $27 \div 3 = 9 \text{ R}0$
 $40 \div 8 = 5 \text{ R}0$

ERROR ALERT



If the remainder is greater than the divisor, keep dividing the counters evenly until the remainder is less than the divisor.

Notes for parents :

- Ask your child what the numbers in the equation represent in the problem. Label the numbers in the equation with the correct vocabulary words.

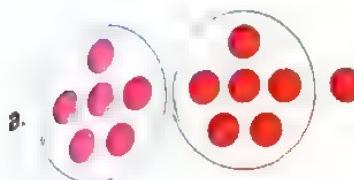
Example 1

Find the quotient and the remainder. You may use counters to model.

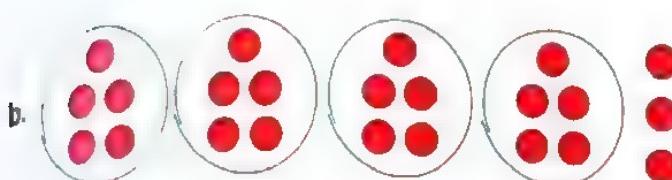
a. $13 \div 2$

b. $23 \div 4$

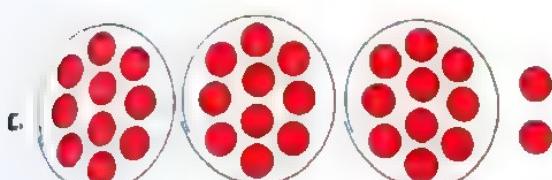
c. $32 \div 3$

Solution 

$13 \div 2 = 6 \text{ R } 1$



$23 \div 4 = 5 \text{ R } 3$



$32 \div 3 = 10 \text{ R } 2$

**Remember**

Division is the inverse
of multiplication

$2 \times 6 = 12$

$12 \div 2 = 6$

So

$13 \div 2 = 6 \text{ R } 1$

because $13 = [2 \times 6] + 1$

Note that

The remainder is
always less than
the divisor.

Example 2

There are 62 students in fourth grade in a school. Each table in the library room seats six students. How many tables are needed to seat all fourth graders?

Solution

This problem would be solved using division $62 \div 6 = 10 \text{ R } 2$

11 tables are needed (10 tables will be filled and one more table is needed
for the 2 extra students) So, $10 + 1 = 11$ tables are needed.

**Check your understanding**

Find the quotient and the remainder. You may use counters to model.

a. $17 \div 5$

b. $26 \div 6$

c. $9 \div 2$

* Your child may be confused by having a remainder in a division problem. He/She may try to place the remainder into an existing group or into an additional group, both leading to unequal sharing.

Exercise

38

7-10 Exploring Remainders

REMEMBER

ARTY

PROBLEM SOLVING

From the school book

1. Find the quotient and the remainder. Complete the table. You may use counters to model.

Problem	Quotient	Remainder	Model
a. $15 \div 6$			
b. $5 \div 4$			
c. $38 \div 5$			
d. $22 \div 7$			
e. $26 \div 3$			
f. $17 \div 9$			

2. Find each quotient and remainder. Complete the following.

a. $11 \div 3 = \boxed{\quad} R \boxed{\quad}$

b. $7 \div 2 = \boxed{\quad} R \boxed{\quad}$

c. $26 \div 4 = \boxed{\quad} R \boxed{\quad}$

d. $51 \div 8 = \boxed{\quad} R \boxed{\quad}$

e. $20 \div 9 = \boxed{\quad} R \boxed{\quad}$

f. $12 \div 5 = \boxed{\quad} R \boxed{\quad}$

3. Find each quotient and remainder. You may use counters to help you.

a. $13 \div 2 = \underline{\hspace{2cm}}$

b. $18 \div 7 = \underline{\hspace{2cm}}$

c. $30 \div 4 = \underline{\hspace{2cm}}$

d. $22 \div 6 = \underline{\hspace{2cm}}$

e. $42 \div 8 = \underline{\hspace{2cm}}$

f. $57 \div 7 = \underline{\hspace{2cm}}$

g. $26 \div 5 = \underline{\hspace{2cm}}$

h. $93 \div 9 = \underline{\hspace{2cm}}$

i. $35 \div 6 = \underline{\hspace{2cm}}$

4. Find each quotient and remainder. Circle all the problems which has 0 left over.

a. $20 \div 7 =$ _____

b. $18 \div 9 =$ _____

c. $31 \div 8 =$ _____

d. $72 \div 9 =$ _____

e. $51 \div 5 =$ _____

f. $22 \div 2 =$ _____

g. $44 \div 6 =$ _____

h. $24 \div 3 =$ _____

i. $65 \div 10 =$ _____

5. Solve the following problems.

- a. A box can hold 6 basketballs. There are 50 basketballs. How many boxes can be filled ?
How many boxes are needed to hold all the basketballs ?
-
-
-

- b. Saleem brought 15 pies to give to 4 of his friends. How can Saleem share the pies equally ? What is left ?
-
-
-

- c. Rose has 19 biscuits to give to her 9 friends.
 How can Rose share the biscuits equally ? What is left ?
-
-
-

- d. A full box of crayons contains 8 crayons. If each of the 42 students in a class needs to use 1 crayon at the same time in a class activity.
How many boxes of crayons are needed for all the students ?
-
-
-

- e. There are 48 mugs that need to be put in boxes and shipped. Five mugs can fit in each box. How many boxes will be needed to ship the mugs ?
-
-
-

- f. There are 30 students in primary stage going to the big game against another school. If 4 students can ride in one car, how many cars do they need?

- g. Going to a Swim Meet. The swim team is taking a bus to a swim meet. Each bus seats 40 students. Sixty students will attend the meet. How many buses are needed? Use numbers, words, and symbols to explain your thinking.

- h. Thirty-two people need to travel to a special event in Zamalek. There are many different ways they can travel to the event. They can only choose one of the ways to travel for the whole group of people. Look at all of the forms of transportation they can take on the chart.

Form of transportation	How many people can fit on each ?	Equation
Microbus	9	
Motorbike	2	
Car	4	
Van	7	

Which form of transportation should the group take to the event? Explain your answer.



Challenge

6. Each page of Ahmed's album holds 4 photographs. He filled all 9 pages and still had 3 photos left over.

How many photos did Ahmed have to start with?

Multiple Choice Questions

Choose the correct answer.

1. The amount that is left over when a number cannot be divided evenly is called
- dividend
 - divisor
 - quotient
 - remainder

5. $11 \div 3 =$ _____

- $3R1$
- $4R1$
- $3R2$
- $4R2$

5. $46 \div 8 =$ _____

- $4R6$
- $4R8$
- $5R6$
- $5R8$

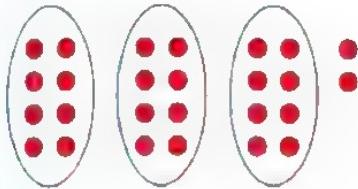
7. $52 \div 7 =$ _____

- $7R1$
- $7R2$
- $7R3$
- $7R4$

9. $27 \div 9 =$ _____

- $2R8$
- $3R1$
- $3R0$
- $3R8$

11. Which division problem does the model show?



- $24 \div 3 = 8$
- $23 \div 3 = 7R2$
- $26 \div 3 = 8R2$
- $21 \div 3 = 7$

13. Mary cooked 32 cups of soup and poured it into containers that filled up with 6 cups each. How many cups of soup were left over?

- 2 cups.
- 4 cups.
- 5 cups.
- 6 cups.

2. The number, not including the remainder, that results from dividing is called
- dividend
 - divisor
 - quotient
 - product

4. $28 \div 6 =$ _____

- $5R2$
- $4R4$
- $5R4$
- $4R2$

6. $36 \div 4 =$ _____

- $8R3$
- $9R1$
- $9R2$
- $9R0$

8. $5 \div 3 =$ _____

- $1R0$
- $1R1$
- $1R2$
- $1R3$

10. $25 \div 2 =$ _____

- $12R0$
- $12R1$
- $13R0$
- $13R1$

12. Which of the following shows $22 \div 3$?

- 22 dots in each of 3 circles.
- 3 circles, two with 7 dots and one with 8 dots.
- 3 circles, each with 7 dots.
- 3 circles, each with 8 dots.

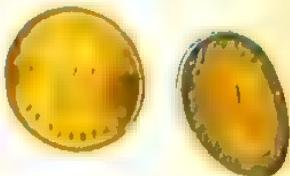
14. Ramez is packing 54 muffins in boxes. Each box contains 5 muffins. How many boxes are needed to pack all the muffins?

- 9 boxes.
- 10 boxes.
- 11 boxes.
- 12 boxes.

7.11 Patterns and Place Value in Division

Learn

Sara's family collected coins, when the jar was full, Sara's father gave the coins to his three daughters.



They counted 6,000 coins and shared them equally.

How many coins did each girl get?

Divide : $6,000 \div 3$.

Basic facts, pattern and place value can help you divide.

Use the basic fact $6 \div 3 = 2$

$$6 \div 3 = 2$$

$$6 \underset{\text{Three zeroes}}{0} \div 3 = 2 \underset{\text{Three zeroes}}{0}$$

$$6, \underset{\text{Three zeroes}}{0}00 \div 3 = 2, \underset{\text{Three zeroes}}{0}00$$

What do you notice about the pattern of zeroes?



So, each girl got 2,000 coins.

Remember

$$6 \div 3 = 2$$

6 is called the dividend

3 is called the divisor

2 is called the quotient

More Examples :

$$32 \div 8 = 4$$

$$40 \div 5 = 8$$

$$63 \div 7 = 9$$

$$320 \div 8 = 40$$

$$400 \div 5 = 80$$

$$630 \div 7 = 90$$

$$3,200 \div 8 = 400$$

$$4,000 \div 5 = 800$$

$$6,300 \div 7 = 900$$

$$32,000 \div 8 = 4,000$$

$$40,000 \div 5 = 8,000$$

$$63,000 \div 7 = 9,000$$

Notes for parents :

- Your child may only look at the place with the highest value and try to divide. For example, with $2,400 \div 3$, he/she may try to solve $2 \div 3$ instead of $24 \div 3$.

Example 1

Use patterns to find the quotient.

a. $8 \div 2 =$

$80 \div 2 =$

$800 \div 2 =$

$8,000 \div 2 =$

b. $15 \div 5 =$

$150 \div 5 =$

$1,500 \div 5 =$

$15,000 \div 5 =$

c. $20 \div 4 =$

$200 \div 4 =$

$2,000 \div 4 =$

$20,000 \div 4 =$

Solution 

a. 4

40

400

4,000

b. 3

30

300

3,000

c. 5

50

500

5,000

Example 2

Write the basic fact that you can use to solve these problems. Then solve each problem.

Problem	Basic Fact	Quotient
a. $90 \div 3$		
b. $160 \div 2$		
c. $5,500 \div 5$		
d. $1,000 \div 2$		

Solution 

Problem	Basic Fact	Quotient
a. $90 \div 3$	$9 \div 3 = 3$	30
b. $160 \div 2$	$16 \div 2 = 8$	80
c. $5,500 \div 5$	$55 \div 5 = 11$	1,100
d. $1,000 \div 2$	$10 \div 2 = 5$	500

* You child may be confused by how many zeroes to put in a quotient, especially when the basic fact includes zeroes. For example, the basic fact for $2,000 \div 4$ is $20 \div 4 = 5$. The quotient is 500 since there are two other zeroes in the dividend.

Example 3

Complete each missing number.

a. $140 \div 7 =$

d. $280 \div \underline{\quad} = 40$

b. $35,000 \div 5 = \underline{\quad}$

e. $\underline{\quad} \div 8 = 30$

c. $\underline{\quad} \div 3 = 100$

f. $3,200 \div \underline{\quad} = 800$

Solution

a. 20

d. 7

b. 7,000

e. 240

c. 300

f. 4



Check your understanding

1. Use patterns and place value to find each quotient.

a. $8 \div 4 = \underline{\quad}$

$80 \div 4 = \underline{\quad}$

$800 \div 4 = \underline{\quad}$

$8,000 \div 4 = \underline{\quad}$

b. $18 \div 9 = \underline{\quad}$

$180 \div 9 = \underline{\quad}$

$1,800 \div 9 = \underline{\quad}$

$18,000 \div 9 = \underline{\quad}$

c. $3 \div 3 = \underline{\quad}$

$30 \div \underline{\quad} = 10$

$\underline{\quad} \div 3 = 100$

$3,000 \div 3 = \underline{\quad}$

2. How can you use $16 \div 4 = 4$ to help you find $160 \div 4$?

Notes for parents :

- Make sure your child recognize that the number of zeroes in the dividend is the same as the number of zeroes in the quotient unless the basic fact has a zero in it.

7-11 Patterns and Place Value in Division

• WORKSHEET • QUIZ • GAMES • PRACTICE SHEETS

From the school book

Use patterns and place value to find each quotient.

a. $6 \div 2 =$

$60 \div 2 =$

$600 \div 2 =$

$6,000 \div 2 =$

d. $7 \div 7 =$

$70 \div 7 =$

$700 \div 7 =$

$7,000 \div 7 =$

b. $18 \div 3 =$

$180 \div 3 =$

$1,800 \div 3 =$

$18,000 \div 3 =$

e. $32 \div 8 =$

$320 \div 8 =$

$3,200 \div 8 =$

$32,000 \div 8 =$

c. $42 \div 6 =$

$420 \div 6 =$

$4,200 \div 6 =$

$42,000 \div 6 =$

f. $63 \div 9 =$

$630 \div 9 =$

$6,300 \div 9 =$

$63,000 \div 9 =$

2. **Division Patterns** Label the parts in the equation using the words divisor, dividend, and quotient. Then, look for patterns to complete the remaining problems. The first problem in the table is an example that is filled in for you.

Equation	Basic (Related) Fact	Quotient
$600 \div 3$	$6 \div 3 = 2$	200
$150 \div 5$		
$1,200 \div 6$		
$200 \div 4$		
$700 \div 7$		
$6,400 \div 8$		
$4,500 \div 9$		
$270 \div 3$		

3. Find the quotient. Use basic facts and place value patterns to help you divide.

a. $4 \text{ ones} \div 2 =$ ones

$$4 \div 2 =$$

4 tens $\div 2 =$ tens

$$40 \div 2 =$$

4 hundreds $\div 2 =$ hundreds

$$400 \div 2 =$$

4 thousands $\div 2 =$ thousands

$$4,000 \div 2 =$$

b. $3 \text{ ones} \div 3 =$ ones

$$3 \div 3 =$$

3 tens $\div 3 =$ tens

$$30 \div 3 =$$

3 hundreds $\div 3 =$ hundreds

$$300 \div 3 =$$

3 thousands $\div 3 =$

$$3,000 \div 3 =$$

c. $24 \text{ ones} \div 8 =$ ones

$$24 \div 8 =$$

24 tens $\div 8 =$ tens

$$240 \div 8 =$$

24 hundreds $\div 8 =$ hundreds

$$2,400 \div 8 =$$

24 thousands $\div 8 =$ thousands

$$24,000 \div 8 =$$

d. $42 \text{ ones} \div 6 =$ ones

$$42 \div 6 =$$

42 tens $\div 6 =$ tens

$$420 \div 6 =$$

42 hundreds $\div 6 =$ hundreds

$$4,200 \div 6 =$$

42 thousands $\div 6 =$ thousands

$$42,000 \div 6 =$$

4. Find each quotient.

a. $27 \div 3 =$

b. $54 \div 9 =$

c. $120 \div 6 =$

d. $720 \div 8 =$

e. $180 \div 2 =$

f. $450 \div 5 =$

g. $3,600 \div 6 =$

h. $4,900 \div 7 =$

i. $3,200 \div 4 =$

j. $6,400 \div 8 =$

k. $4,000 \div 5 =$

l. $2,100 \div 7 =$

m. $30,000 \div 6 =$

n. $81,000 \div 9 =$

o. $24,000 \div 4 =$

5. Complete the missing numbers.

a. $18 \div \boxed{\quad} = 6$

b. $120 \div \boxed{\quad} = 20$

c. $630 \div \boxed{\quad} = 90$

d. $70 \div \boxed{\quad} = 10$

e. $\boxed{\quad} \div 3 = 30$

f. $\boxed{\quad} \div 4 = 700$

g. $1,600 \div \boxed{\quad} = 800$

h. $3,200 \div \boxed{\quad} = 400$

i. $4,500 \div \boxed{\quad} = 500$

j. $\boxed{\quad} \div 9 = 9,000$

k. $\boxed{\quad} \div 3 = 8,000$

l. $\boxed{\quad} \div 1 = 9,000$

m. $\boxed{\quad} \div 5 = 5,000$

n. $\boxed{\quad} \div 6 = 8,000$

o. $\boxed{\quad} \div 7 = 6,000$

6. Solve the following problems.

a. Mrs. Farida's class is 60 minutes long. She wants to divide her class time into 3 equal periods. How long will each period be?

b. Bassem is reading a book of 180 pages. If he reads 9 pages per day, how long will it take him to finish the book?

c. There were 540 crayons in a large bin. Students were asked to put 9 crayons in a small box for each student to use.

How many small boxes will students need in order to complete this task?

d. At a primary school, the students collected 3,000 pounds as a donation to kids Hospital. Each student donated 5 pounds. How many students donated?

e.  **Riding the Metro**

There are 8,100 people that need to get to work on Monday morning at 7:00 a.m. They all want to take the Metro to work. There are 9 cars on each Metro. If 90 people can fit in each car, can all the people take the same metro to work? Explain your thinking using numbers, words and symbols.

f. A factory produced 54,000 pieces of toys in 9 months. The factory produced the same number of pieces each month.

How many pieces did the factory produce per month?

Challenge

7. A class wants to plant 450 flowers for Earth Day, in equal rows. If they plant 50 rows.

How many flowers are in each row?

Multiple Choice Questions

Choose the correct answer.

1. $80 \div 2 =$

- A. 4
- B. 40
- C. 400
- D. 160

3. $160 \div 4 =$

- A. 4
- B. 40
- C. 400
- D. 4,000

5. $4,200 \div 7 =$

- A. 6
- B. 60
- C. 600
- D. 6,000

7. $63,000 \div 9 =$

- A. 7
- B. 70
- C. 700
- D. 7,000

9. $320 \div \underline{\quad} = 40$

- A. 8
- B. 80
- C. 800
- D. 8,000

11. $\underline{\quad} \div 7 = 300$

- A. 21
- B. 210
- C. 2,100
- D. 21,000

13. $63 \text{ tens} \div 7 = \underline{\quad} \text{ tens}$

- A. 9
- B. 90
- C. 900
- D. 9,000

2. $400 \div 8 =$

- A. 5
- B. 50
- C. 500
- D. 5,000

4. $3,000 \div 3 =$

- A. 1
- B. 10
- C. 100
- D. 1,000

6. $2,000 \div 5 =$

- A. 4
- B. 40
- C. 400
- D. 4,000

8. $56 \div 7 =$

- A. 8
- B. 80
- C. 800
- D. 8,000

10. $3,500 \div \underline{\quad} = 700$

- A. 2
- B. 3
- C. 4
- D. 5

12. $\underline{\quad} \div 6 = 4,000$

- A. 24
- B. 240
- C. 2,400
- D. 24,000

14. $27 \text{ hundreds} \div 9 =$

- A. 30 hundreds
- B. 3 tens
- C. 30 tens
- D. 300 tens

100	200	300
100	200	300

~~100+200=300~~

~~100~~

~~200~~

~~300~~

~~Treasures~~

~~100~~

~~200~~

~~300~~

~~100~~

~~200~~

~~300~~

~~Q. Who can tell you easily the following division equations?~~

$$100 \div 1 = 100$$

$$200 \div 2 = 100$$

$$300 \div 3 = 100$$

A. The quotients are multiples of 100

B. The quotients are multiples of 10

C. The quotients are multiples of 1000

D. The quotients are multiples of 1000

~~Q. Sam wants to give 300 marbles from his marble collection to 4 of his friends. He wants to give each friend the same number of marbles.~~

~~How many marbles will each friend receive?~~

A. 60 marbles

B. 600 marbles

C. 30 marbles

D. 300 marbles

7-12 The Area Model and Division

Learn

Bassem's family drove 615 kilometers in 3 days. They drove the same number of kilometers every day.

How many kilometers did they drive per day?



Divide : $615 \div 3$

You can use an area model for division.

Step 1

Draw a long rectangle and write 3 on the smaller left side of the rectangle.

3

Think

$$615 = 600 + 15$$



Step 2

Since $3 \times 200 = 600$, then 600 is a multiple of 3 which is the divisor in this problem.

Draw a vertical line inside the rectangle. Write $3 \times 200 = 600$ inside the section of the model and 200 underneath.

3

$$3 \times 200 = 600$$

200



Remember

Area of rectangle

= length × width

Step 3

Since $3 \times 5 = 15$, then 15 is a multiple of 3 which is the divisor in this problem. Write $3 \times 5 = 15$ inside the empty section of the model and 5 underneath.

3

$$3 \times 200 = 600$$

$$3 \times 5 = 15$$

200

5 R0

Notes for parents :

- Your child may get confused with how many zeroes to place at the end of a product. For example, he/she may write $7 \times 3,000 = 2,100$ instead of $7 \times 3,000 = 21,000$. Your child may also write $4 \times 500 = 200$ instead of $4 \times 500 = 2,000$.

Check your answers and there is no left over.

(C) $600 \div 15 = 40$ $15 \times 40 = 600$ (no remainder)

(D) $200 \div 5 = 40$

(E) $615 \div 3 = 205$

So, 205 kilometers per day for 3 days.

(F)

Example 1

D 548 pencils will be shared among 5 classrooms. How many pencils will each classroom get?

Solution 

Divide: $548 \div 5$

Use an area model for division.



Draw a long rectangle and write 5 on the smaller left side of the rectangle.

Step 2:

Since $5 \times 100 = 500$, draw a vertical line inside the rectangle.

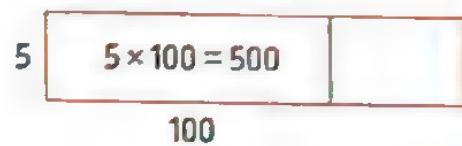
Write $5 \times 100 = 500$ inside the section of the model and 100 underneath.

Step 3:

There are 48 pencils left to be divided known that $5 \times 10 = 50$ and $5 \times 9 = 45$

So, write $5 \times 9 = 45$ inside the empty section of the model and 9 underneath.

Your child may have difficulty determining which multiples to use to start decomposing a dividend when using an area model. It is most effective and efficient to start with multiplying the divisor by 10, 100 or 1,000. For example, for $256 \div 8$, it is helpful to begin with $8 \times 10 = 80$ and to work up to 256.



Step 4

Since there are 3 left over not enough to make another group of 5, there is a remainder that is 3.
So, write 3 outside the rectangle next to the area model.

$$\begin{array}{r} 5 \times 100 = 500 \\ 100 \\ \hline 5 \times 9 = 45 \\ 9 \\ \hline R: 3 \end{array}$$

Step 5

Check your answers.

Add the areas and the remainder: $500 + 45 + 3 = 548$

Add the sides and the remainder: $100 + 9 R 3 = 109 R 3$

then: $548 \div 5 = 109 R 3$

So, each class will get 109 pencils and there are 3 pencils left over that cannot be shared evenly among the classes.

Example 2

Draw an area model to solve each problem.

a. $69 \div 3$

b. $825 \div 4$

c. $3,600 \div 6$

Remember
Check the left over in each problem

Solution

a. Think: $69 = 60 + 9$

3	$3 \times 20 = 60$	$3 \times 3 = 9$
20		3

Add the areas: $60 + 9 = 69$ R 0 (no remainder)

Add the sides: $20 + 3 = 23$

So, $69 \div 3 = 23$

b. Think: $825 = 800 + 25$, $25 = 24 + 1$

4	$4 \times 200 = 800$	$4 \times 6 = 24$
200		6 R1

Add the areas: $800 + 24 + R1 = 825$

Add the sides: $200 + 6 R1 = 206 R1$

So, $825 \div 4 = 206 R1$

c. 6

$6 \times 600 = 3,600$

600

So, $3,600 \div 6 = 600$ [no remainder]



Check your understanding

Use the area to model the following problem.

$535 \div 5$

Notes for parents :

- Let your child check the left over in each problem.

7-12 The Area Model and Division

© AMT

PROBLEM SOLVING

From the school book

Use the area model to solve each of the following.

a. $40 \div 2$

b. $85 \div 4$

c. $217 \div 5$

d. $159 \div 3$

e. $636 \div 6$

f. $484 \div 8$

2. Use the area model to solve the problems. Show your work.

a. $48 \div 4$

b. $67 \div 3$

c. $613 \div 3$

d. $810 \div 9$

e. $742 \div 7$

f. $248 \div 6$

g. $\square 455 \div 4$

h. $535 \div 5$

i. $\blacksquare 3,200 \div 8$

j. $4,500 \div 9$

3. Solve each problem using an area model.



- a. Sylvia is sharing her muffines. If she shares 63 muffines among 3 groups of people , what is the share of each group ?



- a. An organization donated 89 books to a school.
The books will be shared among 6 classrooms.
How many books will each classroom get?



- b. A factory makes 546 teddy bears. The manufacturers have boxes that can hold 6 bears each.
How many boxes is needed to hold all the teddy bears?
How many bears will be left over?



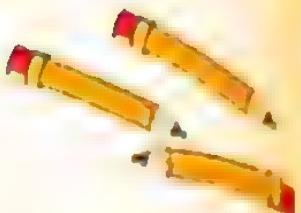
- c. Seven classes collected cans for recycling and made 497 pounds. They agreed to split the money evenly. How much did each class earn?



- e. Rashida saved 545 L.E. to buy a toy car.
She did this by saving 5 L.E. every day she worked around her neighborhood. How many days did she have to work to save enough money to buy a toy car?



f.  There are 864 pencils. The pencils have to be divided equally among 4 classrooms. How many pencils will each classroom get?



g. Amgad saved 868 coins last year. He wanted to put them into 8 jars. How many coins will be in each jar? Is there any coins left over?



h. Osama bought lunch for 6 people. He spent 672 pounds. If each person's lunch cost the same amount. How much did one lunch cost?



i.  Amir bought a book of stickers. There were 92 stickers in the book. He wanted to give them to 4 of his friends. How many stickers will each of his friends get?

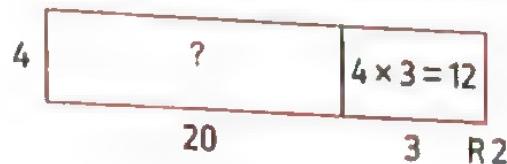


- Writing About Math.** There are 492 cars that need to park at the stadium. The stadium has 4 parking lots. The stadium wants the same number of cars to park in each lot. How could you use the previous problem to help you solve $492 \div 4$? In words, numbers and symbols to explain your thinking.

b. Critical thinking.

- A. How can $96 \div 3$ help you find $696 \div 3$?

- b. Which choice best completes the area model to find $94 \div 4$?



A. $4 \times 2 = 8$

B. $4 \times 20 = 80$

C. $20 + 4 = 24$

D. $4 \times 16 = 20$

Complete: $94 \div 4 =$ _____

- c. The divisor is 6 and the dividend is 752. Divide.

- d. Nine students are sharing marbles equally. If they have 12 marbles, how many marbles will be left over? How many marbles will be left over if there are 112 marbles?

Multiple Choice Questions

Choose the correct answer.

1. In the opposite area model, which choice best represents the problem?
- A. $515 \div 5$
B. $502 \div 5$
C. $512 \div 5$
D. $517 \div 5$

2. Which area model best represents $828 \div 4$?

A. 4 | $4 \times 100 = 400$ | $4 \times 7 = 28$
 $\overline{100} \qquad \qquad \overline{7}$

C. 4 | $4 \times 200 = 800$ | $4 \times 7 = 28$
 $\overline{200} \qquad \qquad \overline{7}$

3. Which area model represents $87 \div 5$?

A. 5 | $5 \times 10 = 50$ | $5 \times 7 = 35$
 $\overline{50} \qquad \qquad \qquad \overline{35} \quad R\ 2$

B. 5 | $5 \times 10 = 50$ | $5 \times 7 = 35$
 $\overline{10} \qquad \qquad \qquad \overline{7} \quad R\ 2$

C. 5 | $8 \times 10 = 80$ | $1 \times 7 = 7$
 $\overline{10} \qquad \qquad \qquad \overline{7}$

D. 5 | $8 \times 10 = 80$ | $1 \times 7 = 7$
 $\overline{80} \qquad \qquad \qquad \overline{7}$

5 | $5 \times 100 = 500$ | $5 \times 3 = 15$
 $\overline{100} \qquad \qquad \qquad \overline{3} \quad R\ 2$

B. 8 | $8 \times 100 = 800$ | $8 \times 3 = 24$
 $\overline{100} \qquad \qquad \qquad \overline{3} \quad R\ 4$

D. 4 | $4 \times 200 = 800$ | $4 \times 7 = 28$
 $\overline{800} \qquad \qquad \qquad \overline{28}$

4. Which area model represents $58 \div 7$?

A. 7 | $7 \times 7 = 49$ | $7 \times 1 = 7$
 $\overline{7} \qquad \qquad \qquad \overline{1} \quad R\ 2$

B. 7 | $7 \times 7 = 49$ | $7 \times 1 = 7$
 $\overline{49} \qquad \qquad \qquad \overline{7} \quad R\ 2$

C. 7 | $5 \times 10 = 50$ | $7 \times 1 = 7$
 $\overline{10} \qquad \qquad \qquad \overline{7} \quad R\ 1$

D. 7 | $5 \times 10 = 50$ | $1 \times 8 = 8$
 $\overline{50} \qquad \qquad \qquad \overline{8}$

5. Which number best completes the area model to find $148 \div 6$?



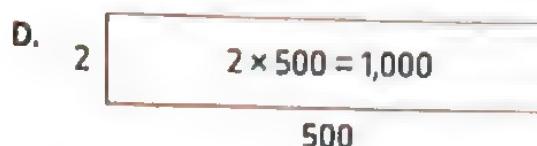
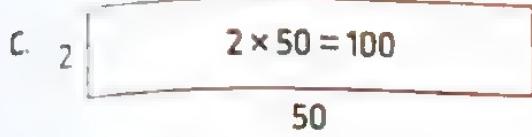
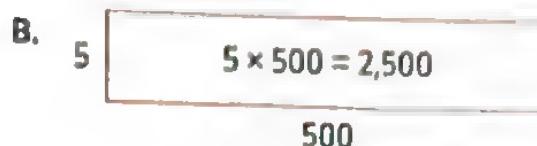
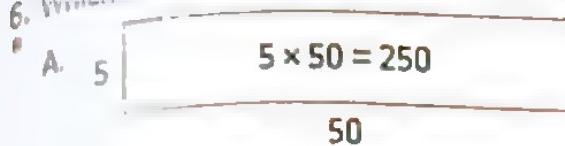
The value of ? is _____

- A. $6 \times 2 = 12$
- C. $20 + 4 = 24$

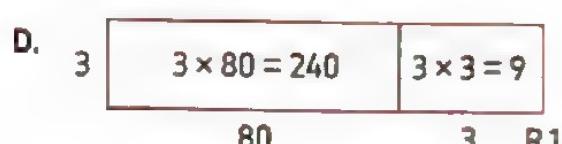
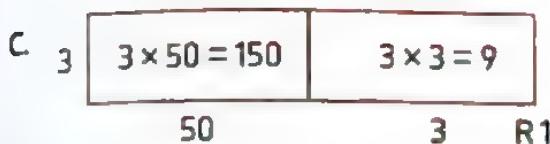
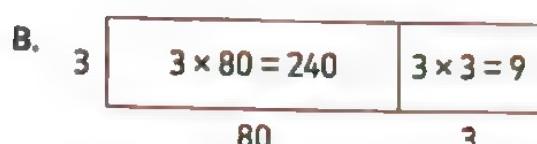
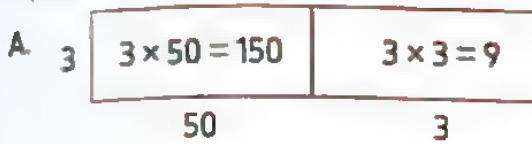
B. $6 \times 20 = 120$

D. $20 + 4 + 2 = 26$

6. Which area model best represents $2,500 \div 5$?



7. Amir wants to divide 250 pounds among his 3 sons. Which of the following area models represents the problem?



8. $93 \div 4 =$ _____

- A. 25 R3
- B. 23 R1
- C. 24 R2
- D. 21 R3

9. $372 \div 6 =$ _____

- A. 61 R1
- B. 61 R5
- C. 62
- D. 61

10. A chicken farmer uses egg cartons made from recycled material. If 6 eggs fit into each carton, how many cartons will he need for 312 eggs?

- A. 50 cartons
- B. 51 cartons
- C. 52 cartons
- D. 53 cartons

7-13 The Partial Quotients Algorithm

7-14 The Standard Division Algorithm

Learn**The partial quotients algorithm**

Bassem packs the cakes in groups of 4 to sell in his market.

If an order calls for 898 cakes, how many packages will Bassem need?



Divide: 898 by 4

1. Draw a line as shown in the figure.

$$\begin{array}{r} \text{Divisor} \\ \downarrow \\ 4 \boxed{898} \end{array}$$

2. Look at the dividend, start from the left there are 8 in the hundreds place = 800
 - 800 is a multiple of 4 because $4 \times 200 = 800$
 - Then write 200 to the right of the line [part of the quotient].

$$\begin{array}{r} 4 \boxed{898} \\ \quad \quad \quad 200 \end{array}$$

3. Write 800 under the dividend and subtract from 898, you will get 98.

$$\begin{array}{r} 4 \boxed{898} \quad 200 \\ - \quad \underline{800} \\ \hline 98 \end{array}$$

4. Write a multiple of 4 that is under 98 and subtract [note $4 \times 10 = 40$], then write 10 to the right of the line as a part of quotient.

$$\begin{array}{r} 4 \boxed{898} \quad 200 \\ - \quad \underline{800} \\ \hline 98 \quad 10 \\ - \quad \underline{40} \\ \hline 58 \end{array}$$

Notes for parents :

- Remind your child to start division from the left.

5. Repeat writing a multiple of 4 under 58 and subtract [note $4 \times 10 = 40 < 58$] and write 10 as a part of quotient to the right of the line.

$$\begin{array}{r} 4 \\ \hline 898 \\ - 800 \\ \hline 98 \\ - 40 \\ \hline 58 \\ - 40 \\ \hline 18 \end{array} \quad \begin{array}{r} 200 \\ 10 \\ 10 \\ 10 \\ 18 \end{array}$$

6. Take a multiple of 4 that is close to 18 [note $4 \times 4 = 16 < 18$]

• Then write 16 under 18 and subtract and write 4 as a part of quotient to the right of the line.

$$\begin{aligned} \text{Then the quotient} &= 200 + 10 + 10 + 4 \\ &= 224 \end{aligned}$$

$$\text{Then } 898 \div 4 = 224 \text{ and the remainder} = 2$$

Note that

4 does not divide 898 equally because there is a remainder = 2

$$\begin{array}{r} 4 \\ \hline 898 \\ - 800 \\ \hline 98 \\ - 40 \\ \hline 58 \\ - 40 \\ \hline 18 \\ - 16 \\ \hline 2 \end{array} \quad \begin{array}{r} 200 \\ 10 \\ 10 \\ 10 \\ 18 \\ 4 \\ 2 \\ \text{remainder} \end{array}$$

Example 1

Divide.

a. $78 \div 6$

b. $658 \div 3$

c. $8,785 \div 7$

Solution

a. $\begin{array}{r} 78 \\ \hline 6 \\ - 60 \\ \hline 18 \\ - 18 \\ \hline 0 \end{array} \quad 10$

b. $\begin{array}{r} 658 \\ \hline 3 \\ - 600 \\ \hline 58 \\ - 30 \\ \hline 28 \\ - 27 \\ \hline 1 \end{array} \quad \begin{array}{r} 200 \\ 10 \\ 9 \end{array}$

c. $\begin{array}{r} 8,785 \\ \hline 7 \\ - 7,000 \\ \hline 1,785 \\ - 1,400 \\ \hline 385 \\ - 350 \\ \hline 35 \\ - 35 \\ \hline 0 \end{array} \quad \begin{array}{r} 1,000 \\ 200 \\ 50 \\ 5 \\ 0 \end{array}$

$$78 \div 6 = 10 + 3 = 13$$

$$658 \div 3 = 200 + 10 + 9 = 219$$

$$8,785 \div 7$$

$$\text{and the remainder} = 1$$

$$= 1,000 + 200 + 50 + 5 = 1,255$$

Your child may use any multiple of divisor to divide.

Learn**Estimating quotients**

Each morning, Ahmed gives a recycling report on his school's television system.

At the school, a team of 6 students picked up 257 recyclable cans and bottles. About how many recyclables per student was that?

- Sometimes you only need to find an estimation. One way to estimate quotients is to substitute numbers that make mental math simpler.
- Mina and Marwan substitute numbers close to 257 to make their mental math simpler.



Mina thinks

$$257 \div 6 \text{ is about}$$

$$300 \div 6$$

$$300 \div 6 = 50$$

Each student picked up about 50 cans and bottles.

Marwan thinks

$$257 \div 6 \text{ is about}$$

$$240 \div 6$$

$$240 \div 6 = 40$$

That was about 40 cans and bottles per student.



Both estimations are reasonable.

Example 2

Estimate the quotient of $63 \div 4$

Solution

The dividend 63 is between 40 and 80

, then $40 \div 4 = 10$ and $80 \div 4 = 20$

, then the quotient is between 10 and 20

Notes for parents :

- Discuss the purpose of rounding versus using basic facts to estimate by asking your child which method makes the problem easier to calculate mentally. Demonstrate how using a basic fact makes estimating easier for $257 \div 6$ by having your child try to find each of these quotients mentally : $300 \div 6$, $240 \div 6$

Ex 3

Find the quotient of $524 \div 3$

Estimate

Solution 

The dividend 524 is between 300 and 600.

Therefore $300 \div 3 = 100$ and $600 \div 3 = 200$.

Therefore the quotient is between 100 and 200.

**Check your understanding**

1. Use the partial quotient algorithm to divide.

a. $52 \div 3$

b. $783 \div 5$

c. $7,320 \div 6$

2. Estimate each quotient.

a. $37 \div 4$

b. $587 \div 2$

c. $762 \div 9$

*Make sure your child uses basic facts and place-value pattern to divide.

Learn**The standard division algorithm**

Students in the third, fourth and fifth grades made 525 origami animals to display in the library. If each grade made the same number of animals, how many animals did each grade make?

Divide: $525 \div 3$ or $3 \overline{)525}$ 

Origami animals

Origami is the Japanese art of folding paper into different shapes.

Step 1

Divide the hundreds.

Divide 5 ÷ 3

$$\begin{array}{r} 1 \\ 3 \overline{)525} \\ - 3 \\ \hline 2 \end{array}$$

Multiply 1×3
Subtract $5 - 3$
Compare $2 < 3$

**Remember**

After you divide the hundreds, tens or ones place, the remainder should always be less than the divisor.

So, each grade made 175 origami animals.

Step 2

Bring down the tens. Divide the tens.

$$\begin{array}{r} 17 \\ 3 \overline{)525} \\ - 3 \\ \hline 22 \\ - 21 \\ \hline 1 \end{array}$$

Bring down the tens.
Divide $22 \div 3$
Multiply 7×3
Subtract $22 - 21$
Compare $1 < 3$

Step 3

Bring down the ones.

Divide the ones.

$$\begin{array}{r} 175 \\ 3 \overline{)525} \\ - 3 \\ \hline 22 \\ - 21 \\ \hline 15 \\ - 15 \\ \hline 0 \end{array}$$

Bring down the ones
Divide $15 \div 3$
Multiply 5×3
Subtract $15 - 15$
Compare $0 < 3$

Check
Multiply

$3 \times 175 = 525$
The product equals the dividend

Other Examples:**a. With a remainder**

$$\begin{array}{r} 168R4 \\ 5 \overline{)844} \\ - 5 \\ \hline 34 \\ - 30 \\ \hline 44 \\ - 40 \\ \hline 4 \end{array}$$

Check: $168 \times 5 + 4$
then add the remainder

4 is less than 5,
so it is the remainder.

b. Zero in the dividend

$$\begin{array}{r} 117 \\ 6 \overline{)702} \\ - 6 \\ \hline 10 \\ - 6 \\ \hline 42 \\ - 42 \\ \hline 0 \end{array}$$

Check: 117×6

HATH IDEA
The order of division is as follows:

Divide
Multiply
Subtract
Compare
Bring down

Repeat this order until the division is complete.

Notes for parents :

- To help your child remember all steps in the division algorithm, let him/her use the following mnemonic or make up one of his/her own. Don't Make Silly Careless Blunders (Divide, Multiply, Subtract, Compare, Bring down).

Example 4

$$\cdot \quad 1765 \div 4$$

Step 1

divide, multiply, subtract, compare, bring down.

1

- 1 Divide 17 by 4
- 2 Bring down 6
- 3 Multiply 4 by 4
- 4 Subtract 16 - 16
- 5 Compare 0 < 6
- 6 Bring down 5

Step 2

044

$$\begin{array}{r} 41765 \\ - 16 \\ \hline 16 \\ - 16 \\ \hline 0 \end{array}$$

Bring down the tens
Bring down 6
Divide 16 by 4
Multiply 4 by 4
Subtract 16 - 16
Compare 0 < 6

Step 3

0441

$$\begin{array}{r} 41765 \\ - 16 \\ \hline 16 \\ - 16 \\ \hline 05 \\ - 4 \\ \hline 1 \end{array}$$

Bring down the ones
Bring down 5
Divide 5 by 4
Multiply 4 by 1
Subtract 5 - 4
Compare 1 < 4
the remainder = 1

$$\text{then, } 1765 \div 4 = 441 \text{ R } 1$$

example 5

$$\text{divide: } 432 \div 4$$

solution

(zero in the quotient)

Step 1

divide the 4 hundreds.

$$\begin{array}{r} 1 \\ 4 \overline{)432} \\ - 4 \\ \hline 0 \end{array}$$

Step 2

Bring down the 3 tens.
Divide the 3 tens.

$$\begin{array}{r} 10 \\ 4 \overline{)432} \\ - 4 \\ \hline 03 \\ - 0 \\ \hline 3 \end{array}$$

3 < 4
, so write a 0
in the quotient.

Step 3

Bring down the 2 ones. Divide
the 32 ones.

$$\begin{array}{r} 108 \\ 4 \overline{)432} \\ - 4 \\ \hline 03 \\ - 0 \\ \hline 32 \\ - 32 \\ \hline 0 \end{array}$$

$$\text{then, } 432 \div 4 = 108$$



your understanding

Divide.

a. $525 \div 5$

b. $685 \div 4$

Remind your child of the division algorithm : divide, multiply, subtract, compare and bring down

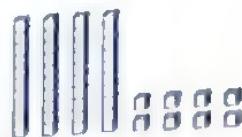
Remind your child of including the remainder as a part of the answer.

Learn**Model Division****Activity 1**

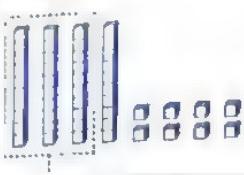
Divide 48 into 3 equal groups. Write $48 \div 3$ or $3 \overline{)48}$
Make a model to show how many are in each group.



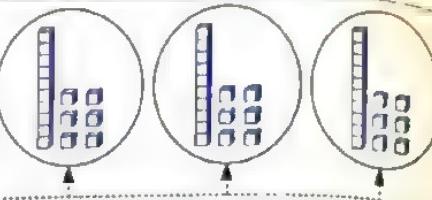
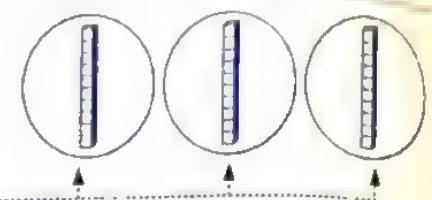
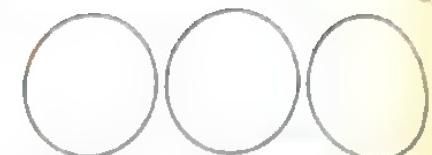
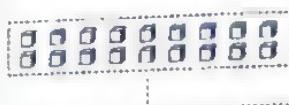
Show 48 as 4 tens and 8 ones. Draw circles to make 3 equal groups.



Place an equal number of tens into each group.



Step 3 Regroup 1 ten and 8 ones as 18 ones. Place an equal number of ones into each group.



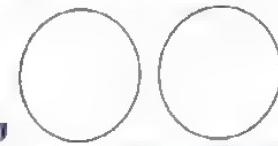
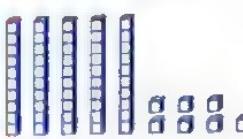
$$\text{So, } 48 \div 3 = 16$$

Activity 2

Here is a way to record division. Divide 57 by 2.



Show the model and 2 equal groups.

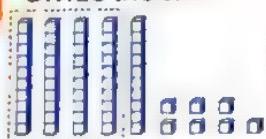


Record:

$$\begin{array}{r} 2 \\ \overline{)57} \end{array}$$



Step 2 Divide the tens.

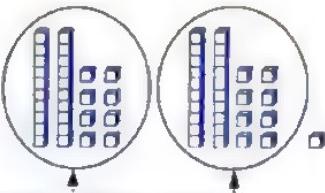


$$\begin{array}{r} 2 \\ \overline{)57} \\ - 4 \\ \hline 1 \end{array}$$

2 tens in each group
4 tens used
1 ten left



Step 3 Regroup. Divide the ones.



$$\begin{array}{r} 28 \text{ R} 1 \\ \overline{)57} \\ - 4 \\ \hline 17 \\ - 16 \\ \hline 1 \end{array}$$

8 ones in each group
16 ones used
1 one left

$$\text{So, } 57 \div 2 = 28 \text{ R} 1$$

Notes for parents :

- Guide your child to model a division problem starting with tens. This is a more efficient method.

7-13 The Partial Quotients Algorithm

7-14 The Standard Division Algorithm

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

Use the partial quotient algorithm to divide.

j. $72 \div 4$



b. $1,1517 \div 4$



c. $1,1244 \div 6$



d. $1,180 \div 5$



e. $1,1897 \div 4$



f. $376 \div 7$



g. $1,1590 \div 5$



h. $1,1892 \div 4$



i. $1,1925 \div 6$



j. $1,1216 \div 3$



k. $3,784 \div 8$



l. $1,17,830 \div 5$



2. Complete to estimate the quotient.

a. $72 \div 3$

The dividend 72 is between 60 and 90, then $60 \div 3 =$ _____, $90 \div 3 =$ _____

, then the quotient is between _____ and _____

b. $524 \div 4$

The dividend 524 is between 400 and 800, then $400 \div 4 =$ _____, $800 \div 4 =$ _____

, then the quotient is between _____ and _____

c. $735 \div 2$

The dividend 735 is between _____ and _____, then $\underline{\quad} \div 2 =$ _____, $\underline{\quad} \div 2 =$ _____

, then the quotient is between _____ and _____

d. $7,462 \div 5$

The dividend 7,462 is between _____ and _____, then $\underline{\quad} \div 5 =$ _____, $\underline{\quad} \div 5 =$ _____

, then the quotient is between _____ and _____

3. Estimate each quotient.

a. $632 \div 8 =$ _____

b. $312 \div 4 =$ _____

c. $762 \div 9 =$ _____

d. $495 \div 6 =$ _____

e. $536 \div 8 =$ _____

f. $3,748 \div 2 =$ _____

g. $4,681 \div 3 =$ _____

h. $8,642 \div 5 =$ _____

4. Copy and complete.

a. $\begin{array}{r} \boxed{} 8 \\ 3 \boxed{5} 4 \\ - 3 \\ \hline 2 \boxed{} \\ - 2 4 \\ \hline 0 \end{array}$

b. $\begin{array}{r} 2 \boxed{} R1 \\ 4 \boxed{8} 5 \\ - \quad \quad \\ \hline 0 \boxed{} \\ - 4 \\ \hline \end{array}$

c. $\begin{array}{r} \boxed{} 1 R3 \\ 5 \boxed{5} 8 \\ - \quad \quad \\ \hline \boxed{} 8 \\ - 5 \\ \hline \end{array}$

d. $\begin{array}{r} \boxed{} \boxed{} R \boxed{} \\ 3 \boxed{4} 1 \\ - 3 \\ \hline \boxed{} \boxed{} \\ - \quad \quad \\ \hline 2 \end{array}$

5. Solve the problems using the standard algorithm.

a. $\square \square 454 \div 3$

Work area

b. $\square \square 192 \div 6$

c. $\square \square 778 \div 2$

d. $\square \square 240 \div 6$

Work area

e. $\square \square 414 \div 4$

f. $\square \square 761 \div 6$

g. $\square \square 368 \div 3$

Work area

h. $\square \square 1,304 \div 4$

i. $\square \square 4,858 \div 4$

j. $\square \square 3,650 \div 5$

Work area

k. $\square \square 1,500 \div 5$

l. $\square \square 5,765 \div 5$

m. $\square \square 2,534 \div 7$

Work area

n. $\square \square 2,920 \div 8$

o. $\square \square 3,287 \div 9$

6. If you had 52 sandwiches to put into 4 lunch boxes.

How many sandwiches would go into each box if you divided them equally?



7. A train has 784 seats for passengers. If there are 7 cars on the train and each car has the same number of seats, how many passengers can sit in each car? Solve the problem using at least two different strategies.



$$784 \div 7$$

First strategy

Second strategy

8. Science Peanuts grow underground in pods.
Each pod is attached to the stem. Suppose you dug up 3 peanut plants and gathered 87 pods. How many pods might have been attached to each plant?



9. There are 154 tourists divided into equal groups. If each group has 7 tourists, how many groups will there be?

10. Nermine takes the train to the city and back 4 times each month. She travels a total of 376 km per month. How far away is the city?

11. Sami has 960 beads in 8 different colors to make jewelry. He has the same number of each color. How many beads of each color does Sami have?



Challenge

12. Youssef divided a number between 55 and 60 by 5. The remainder was 4. What number did Youssef divide?

Choose the correct answer.

$$366 \div 6 =$$

A. 60
B. 61
C. 54
D. 71

2. $74 \div 4 = 18 \text{ R}$

- A. 0
B. 1
C. 2
D. 3

4. $1,836 \div 3$ is closer to

- A. 6
B. 60
C. 600
D. 6,000

6. $736 \div 4$ is closer to

- A. 10
B. 100
C. 200
D. 1,000

is closer to

- A. 50
B. 2,000
C. 3,000
D. 40,000

7. Sara has 270 pieces of ribbon. She wants to give an equal number of them to 8 of her friends. How many pieces of ribbon will each friend receive and how many will be left over?

- A. Each friend will receive 32 pieces. There will be 14 pieces left over.
B. Each friend will receive 34 pieces. There will be 2 pieces left over.
C. Each friend will receive 33 pieces. There will be 6 pieces left over.
D. Each friend will receive 33 pieces. There will be 0 pieces left over.

8. Marawan divides $617 \div 5$ using the partial quotients algorithm. He uses 100 as the quotient on the first step. What is his next step?

$$\begin{array}{r} 5 \\ \boxed{6} \ 1 \ 7 \end{array} \quad | \quad 100$$

- A. Multiply 100 by 617 and subtract the result from 5.
B. Multiply 100 by 617 and add the result to 5.
C. Multiply 100 by 5 and subtract the result from 617.
D. Multiply 100 by 5 and add the result to 617.

7-15 Division and Multiplication

7-16 Solving Challenging Story Problems

Learn

The relation between multiplication and division

There are 736 crayons wanted to be divided among boxes. Each box holds 4 crayons. How many boxes are needed?

Divide: $736 \div 4$

Estimation can help decide whether an answer is reasonable. Division can help solve the problem.

Multiplication can help check the answer.



Known that
Multiplication and division by the same number are opposite operations or inverse operations. One operation undoes the other.

First Estimate the quotient

The dividend 736 is between 400 and 800



Note that

400 and 800 are multiples of 4

then: $400 \div 4 = 100$ and $800 \div 4 = 200$

So, the quotient is between 100 and 200

Second Divide $736 \div 4$

$$\begin{array}{r} \text{Algorithm strategy} \\ \begin{array}{r} 184 \\ 4 \overline{)736} \\ -4 \downarrow \\ 33 \\ -32 \downarrow \\ 16 \\ -16 \\ \hline 00 \end{array} \end{array}$$

The number of boxes = $736 \div 4$
= 184 boxes

The answer is reasonable.

Third Multiply to check

$$184 \times 4 = 736$$

So, the needed boxes are 184 boxes

Partial strategy

$$\begin{array}{r} 184 \\ \times 4 \\ \hline 16 \\ +320 \\ +400 \\ \hline 736 \end{array}$$

Notes for parents :

- Ask your child to tell you what is the relation between multiplication and division.

Example 1

Write the division problem that matches the multiplication problem.

$$\begin{array}{r} 34 \\ \times 2 \\ \hline 68 \end{array}$$

b.

$$\begin{array}{r} 518 \\ \times 3 \\ \hline 24 \\ + 30 \\ \hline 1,500 \\ + 1,554 \\ \hline 1,554 \end{array}$$

c.

$$\begin{array}{r} 908 \\ \times 7 \\ \hline 56 \\ + 0 \\ \hline 6,300 \\ + 6,356 \\ \hline 6,356 \end{array}$$

solution

a. $68 \div 2 = 34$

b. $1,554 \div 3 = 518$

c. $6,356 \div 7 = 908$

Example 2

Write the division problem that matches the multiplication problem.

a. $14 \times 2 = 28$

b. $161 \times 5 = 805$

c. $105 \times 7 = 735$

d. $320 \times 6 = 1,920$

solution

a. $28 \div 2 = 14$

b. $805 \div 5 = 161$

c. $735 \div 7 = 105$

d. $1,920 \div 6 = 320$



check your understanding

Write the division problem that matches the multiplication problem.

$$\boxed{} \div \boxed{} = \boxed{}$$

$$\begin{array}{r} 27 \\ \times 6 \\ \hline 42 \\ + 120 \\ \hline 162 \end{array}$$

*Ask your child to explain how he/she uses the relation between multiplication and division to solve multiplication and division problems.

Learn**Solving challenging story problems**

Here are some guided steps you may use when solving problems

**Read to understand**

- Read the story loudly more than one time carefully.
- Identify the details and quantities given.
- Identify the hidden question (if exists).
- Search for key words.



- Decide the operation ($+, -, \times, \div$).
- Decide the strategy you can use to solve the problem.

**Solve**

- Solve the hidden question (if exists).
- How can you use the strategy to solve the problem?

**Check**

- How do you know your answer is correct?
- What other strategy could you use to solve the problem?

Example 3

Read the following problem carefully. Solve the problem.

Sandy bought 5 packs of crayons. There are 24 crayons in each of those packs. She also had 6 smaller packs of crayons. There are 12 crayons in each of those.

Sandy wanted to bring all her crayons to school and give them to 8 of her friends.

How many crayons will each friend get?

Notes for parents :

- Remind your child that multistep problem is a problem that involves more than one operation.

Read to understand

Plan

Solve

Check



Solution (1)

the hidden question: How many crayons in the 5 packs?

$$\text{the number of crayons} = 5 \times 24 = 120 \text{ crayons.}$$

(Check the results using the standard algorithm strategy.)

the hidden question: How many crayons in the 6 small packs?

$$\text{the number of crayons} = 6 \times 12 = 72 \text{ crayons.}$$

the hidden question: How many crayons in all?

$$\text{the number of all crayons} = 120 + 72 = 192 \text{ crayons.}$$

the problem: How many crayons will each friend get?

$$\text{the number of crayons} = 192 \div 8 = 24 \text{ crayons.}$$



ANSWER

$$\begin{aligned} [5 \times 24] + [6 \times 12] \div 8 &= [120 + 72] \div 8 \\ &= 192 \div 8 = 24 \text{ crayons} \end{aligned}$$

✓ Check your understanding

Maged has 293 stickers. Amgad has 5 times as many as Maged. Shady has 699 fewer than Amgad. How many stickers does Shady have?

$$\text{Amgad has} = \boxed{\quad} \times \boxed{\quad} = \boxed{\quad} \text{ stickers.}$$

$$\text{Shady has} = \boxed{\quad} - \boxed{\quad} = \boxed{\quad} \text{ stickers.}$$

Some word problems have hidden question or questions that must be answered before you can solve the problem. You have to determine what operation to use and what strategies will you use to help you figure out how to solve the problem.

• CHALLENGE

• HOME SIGHT WORDS

From the story book

1. Write the division problem that matches the multiplication problem.

$$\begin{array}{r} \times 3 \\ \hline 6 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$$

$$\begin{array}{r} \div 3 \\ \hline 10 \\ -30 \\ \hline 0 \end{array}$$

$$\begin{array}{r} \times 3 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$$

$$\begin{array}{r} \div 5 \\ \hline 90 \\ + 40 \\ \hline 540 \\ - 540 \\ \hline 0 \end{array}$$

2. Write the division problem that matches the multiplication problem.

$$\begin{array}{r} \times 6 \\ \hline 38 \\ -36 \\ \hline 2 \end{array}$$

$$\begin{array}{r} \div 3 \\ \hline 1869 \\ -18 \\ \hline 69 \\ -69 \\ \hline 0 \end{array}$$

$$\begin{array}{r} \times 4 \\ \hline 1300 \\ -120 \\ \hline 100 \\ -80 \\ \hline 20 \\ -16 \\ \hline 4 \end{array}$$

$$\begin{array}{r} \div 5 \\ \hline 2525 \\ -25 \\ \hline 25 \\ -25 \\ \hline 0 \end{array}$$

$$\begin{array}{r} \times 7 \\ \hline 49 \\ -42 \\ \hline 7 \\ -7 \\ \hline 0 \end{array}$$

$$\begin{array}{r} \div 9 \\ \hline 93 \\ -81 \\ \hline 12 \\ -9 \\ \hline 3 \\ -3 \\ \hline 0 \end{array}$$

$$\begin{array}{r} \times 6 \\ \hline 78 \\ -72 \\ \hline 6 \\ -6 \\ \hline 0 \end{array}$$

$$\begin{array}{r} \div 8 \\ \hline 349 \\ -24 \\ \hline 109 \\ -8 \\ \hline 29 \\ -24 \\ \hline 5 \end{array}$$

Part C Value and the Quotient: First, circle the problems you think will have a quotient with fewer digits than the dividend. Then, estimate the quotient and solve each problem using the standard algorithm for division. Think about where to place the first digit in the quotient.

a. $\square \div 2$

The quotient is between _____ and _____

Solution: _____

b. $\square 834 \div 3$

The quotient is between _____ and _____

Solution: _____

c. $\square 346 \div 5$

The quotient is between _____ and _____

Solution: _____

d. $\square 562 \div 8$

The quotient is between _____ and _____

Solution: _____

e. $\square 1,266 \div 6$

The quotient is between _____ and _____

Solution: _____

f. $1,632 \div 4$

The quotient is between _____ and _____

Solution: _____

Q. 4. $6 \times 697 \div 7$

The quotient is (Indivisible) and
solution: _____

b. $1 \times 6,690 \div 4$

The quotient is (Indivisible) and
solution: _____

c. Solve the following problems. You may use multiplication by block paper.

a. $1 \times 166 + 6 =$

b. $1 \times 19 \div 4$

c. $1 \times 27 \div 6 =$

d. $1 \times 1,044 \div 6$

e. $1 \times 166 + 6 =$

f. $1 \times 2,000 \div 4$

g. $1 \times 6,624 \div 6 =$

h. $1 \times 39 \div 4$

i. $1 \times 636 \div 6 =$

j. $1 \times 4,49 \div 9 =$

5. Solve the following story problems.

a. \square Yahla placed 21 paints equally on 3 tables.

How many paints were placed on each table?

Answers:
1. 1000
2. 1000
3. 1000
4. 1000
5. 1000
6. 1000
7. 1000
8. 1000
9. 1000
10. 1000

b. Sarah received 372 L.E. for her birthday. She found some toys that cost 11 L.E. each.
How many toys could she buy?

- c. Hady and his mom want to plant a garden. They buy 35 tomato plants, 16 carrot plants, and 9 beet plants. They want to put the plants into rows of 6. How many plants will be in each row?

- d. There are 164 students who play wind instruments and 20 students who play percussion in the band. If the band instructor puts 8 students in each row, how many rows will there be?

- e. Reem is stuffing envelopes. There are 1,500 envelopes. During the first hour, Reem stuffs 135 envelopes. During the second hour, she stuffs 141 envelopes. How many envelopes will Reem need to stuff in order to finish the job?

- f. Ahmed serves ice cream at a local ice cream shop. He sold 19 ice cream cones on Saturday, 27 ice cream cones on Sunday, and 153 ice cream cones for the entire week. How many ice cream cones did Ahmed sell in all?

- g. Hady has 347 marbles. Kamal has 4 times as many as Hady. Hala has 799 fewer than Kamal. How many marbles does Hala have?

- h. Over the course of 20 weeks, Sarah collected 14 kilograms of cans to recycle. Saleem collected 6 times as much as Sarah. The cans need to be put into bags to take to the recycling center. Each bag holds 7 kilograms of cans.
How many bags will Saleem need for his cans?

- i. A teacher bought 12 packs of crayons. Seven of the packs had 9 crayons in each. The other 5 packs had 10 crayons in each. How many crayons did the teacher buy in all?

- j. Mira bought 4 packs of pencils. There were 28 pencils in each of those packs. She also had 3 smaller packs of pencils at her house. There were 12 pencils in each of those. Mira wanted to bring all her pencils to school and give them to 4 of her friends equally. How many pencils will each friend get?

- k. Four families went to the zoo. Each family has 2 adults and 2 children. Each child's ticket costs 14 L.E. and each adult's ticket costs 22 L.E.
How much will the zoo tickets cost in all?

Multiple Choice Questions

A Choose the correct answer.

B

C

D

1. The division equation that matches

$$126 \times 3 = 378 \text{ is } \underline{\hspace{2cm}}$$

- A. $378 - 3 = 126$
- B. $378 + 3 = 126$
- C. $378 \div 3 = 126$
- D. $378 \times 3 = 126$

3. In the problem $1,866 \div 6$, the quotient is

between $\underline{\hspace{1cm}}$ and $\underline{\hspace{1cm}}$

- A. 100 and 200
- B. 200 and 300
- C. 300 and 400
- D. 400 and 500

5. $48 \div 7 = \underline{\hspace{2cm}}$

- A. $6R4$
- B. $6R5$
- C. $6R6$
- D. $7R1$

7. $2,014 \div 2 = \underline{\hspace{2cm}}$

- A. 17
- B. 107
- C. 1,007
- D. 10,007

9. Hazim has 531 marbles. Ahmed has 3 times as many as Hazim. Rana has 689 fewer than Ahmed.

How many marbles does Rana have?

- A. 1,593 marbles
- B. 215 marbles
- C. 904 marbles
- D. 2,282 marbles

2. Which expression can

be used to check the solution of the opposite division problem?

- A. 28×9
- B. 28×256
- C. $28 \times 9 + 4$
- D. $28 \times 256 + 4$

$$\begin{array}{r} 28R4 \\ 9256 \\ -18 \\ \hline 76 \\ -72 \\ \hline 4 \end{array}$$

4. What is the value of $\underline{\hspace{1cm}}$ in the opposite division problem?

- A. 73
- B. $73R1$
- C. $73R2$
- D. $73R3$

$$\begin{array}{r} ? \\ 4292 \\ -28 \\ \hline 12 \\ -12 \\ \hline 0 \end{array}$$

6. $320 \div 4 = \underline{\hspace{2cm}}$

- A. 80
- B. 90
- C. $80R3$
- D. $90R3$

8. $2,748 \div 9 = \underline{\hspace{2cm}}$

- A. $304R2$
- B. $304R3$
- C. $305R2$
- D. $305R3$

10. Dina distributed 965 pounds among her 5 sons. If she gave each son 150 pounds more as a present

, what is the share of each son?

- A. 43 pounds
- B. 143 pounds
- C. 193 pounds
- D. 343 pounds

Concept 2 Assessment | Unit 7



1. Write (✓) to the correct answer and (✗) to the incorrect answer.

- a. $180 \div 2 = 9$
- b. $63 \div 6 = 10$ and the remainder = 3
- c. $35,000 \div 5 = 7,000$
- d. If $1,095 \div 3 = 365$, then the divisor is 3
- e. $4 \div 24 = 6$
- f. $240 \div 2 = 120$

2. Choose the correct answer.

- a. $30 \div 4 =$ _____
A. 7 R1 B. 6 R2 C. 7 R2 D. 7 R4
- b. $255 \div 5 =$ _____
A. 11 B. 50 C. 51 D. 55
- c. $9,342 \div 3$ is closer to _____
A. 300 B. 3,000 C. 4,000 D. 5,000
- d. $6,300 \div 9 =$ _____
A. 70 B. 700 C. 7,000 D. 70,000
- e. $42 \div 6 =$ _____
A. 7 R0 B. 7 R2 C. 6 R0 D. 6 R1
- f. If $973 \div 3 = 325$, then the dividend is _____
A. 3 B. 325 C. 973 D. 322

3. Complete the following.

- a. The quotient of $3,019 \div 3$ equals _____
- b. _____ $\div 7 = 800$

- c. Dividing $76 \div 2$ using the standard algorithm, the first division is $\underline{\hspace{2cm}} \div \underline{\hspace{2cm}}$, the next division is $\underline{\hspace{2cm}} \div \underline{\hspace{2cm}}$, and the quotient is $\underline{\hspace{2cm}}$

d. $3856 \div 4 = \underline{\hspace{2cm}}$

e. The quotient of $736 \div 6$ is closer to $\underline{\hspace{2cm}}$

f. The division problem in the opposite area model $5 \quad 5 \times 20 = 100$ $5 \times 5 = \underline{\hspace{2cm}}$

g. $\underline{\hspace{2cm}} \div \underline{\hspace{2cm}} = 20$

$$5 \quad 5 \times 20 = 100 \quad | \quad 5 \times 5 = 25$$

20 5 R3

match.

- b. $88 \div 3$
 - c. $360 \div 4$
 - d. $568 \div 4$
 - e. $785 \div 5$

1. 71×2
 2. $150 + 7$
 3. $176 \div 6$
 4. 30×3

5. Use the area model to divide $774 \div 7$.

6. Use the partial quotient algorithm to divide.

$$3,128 \div 3$$

What are the missing values in

the opposite division problem?

$$\begin{array}{r} \boxed{} \\ 3 \boxed{4} 5 7 \\ - 3 \\ \hline \end{array}$$

8. Maged estimated $7,924 \div 4$ as he rounded 7,924 to 7,000, then divided $7,000 \div 4 = 1,750$, but he found that the answer 1,981 is not reasonable.

Explain the mistake of Maged and fix it.